



Confederated Tribes and Bands
of the Yakama Nation ERWM

Established by the
Treaty of June 9, 1855

September 10, 2013

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Subject: Review of the Proposed Plan and Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable units (DOE/RL-2010-99, REV 0; DOE/RL-2010-99-ADD1, REV 0, AND DOE/RL-2011-47, Rev 0).

Dear Ms. Ballinger and Mr. Gadbois:

The U.S. Environmental Protection Agency (EPA) anticipates issuing the Record of Decision (ROD) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units this year. The Confederated Tribes and Bands of the Yakama Nation appreciate the opportunity to review and provide comments on these documents.

The Hanford Reach is one of the most culturally resource-rich areas in the western Columbia Plateau with a well preserved cultural landscape. Pre-Hanford uses of the area included agriculture and use by Native American tribes. Archaeological evidence demonstrates the importance of this area to the Yakama Nation, whose presence can be traced since time immemorial. The near-shore area of the Columbia and Yakima Rivers contained many village sites, fishing and fish processing sites, hunting areas, plant-gathering areas, ceremonial and religious sites. Upland areas were used for hunting, plant gathering, religious practices, and overland transportation. Of the fish community, anadromous and resident fish species use the river as a migration route to and from upstream spawning areas and are of cultural and economic importance. The Treaty of 1855 provide for the people of the Yakama Nation to "live along" and fish the River Corridor.

The Yakama Nation's vision for the cleanup and closure of the Hanford Site includes meeting the following objectives:

1. Compliance with Yakama Nation Treaty Rights, including full access to cultural (and natural) resources by the Yakama Nation and its members within its ceded land and aboriginal territory, which includes the Hanford Site.

2. Official recognition that Native Americans living near the Hanford site are the most vulnerable people to environmental contaminants, as underscored by EPA's Columbia River Fish Contaminant Survey.
3. Protection of the health of Yakama Nation tribal members and the environment so that the Hanford Site and all its resources (including the Columbia River, its islands, other surface waters, geologic resources, groundwater, air, and biological resources such as plants, fish, and wildlife) are safe for all exposure scenarios and tribal uses.
4. Cleanup actions that are complete, permanent, are based on proven technology for application at Hanford, and do not rely on long-term stewardship and institutional controls to address long-lived radionuclide and dangerous waste contamination at the Hanford site. Long-term stewardship and institutional controls will not be effective for wastes that remain dangerous for hundreds or thousands of years.
5. Cleanup decisions that follow the CERCLA RI/FS process and requirements through finalization and approval of documents (including risk assessments and supporting secondary documents) prior to development of Proposed Plans for final RODs.
6. Cleanup decisions based on adequate site-specific characterization information, including the vadose zone and groundwater. There are areas of uncertainty within the groundwater modeling approach (STOMP-1D), and its application is inappropriate until the issues are resolved.
7. Cleanup actions that comply with all applicable or relevant and appropriate federal and state regulatory requirements.
8. Cleanup actions that are compatible with clean closure, including the waste tanks. Cleanup actions that would preclude clean closure should not be implemented.

We look forward to discussing our vision of cleanup and our concerns regarding current cleanup plans for Hanford with you further.

Sincerely,



 Russell Jim
Yakama Nation ERWM Program Manager

cc:

Jane Hedges, Washington State Department of Ecology
Matt McCormick, RL Manager, US Department of Energy
Ken Niles, Oregon Department of Energy
Stuart Harris, CTUIR
Marlene George, YN ERWM
Gab Bohnee, Nez Perce
Administrative Record

Attachment 1:

Note these comments do not reflex a detailed description of all our concerns.

Attachment #1: YN ERWM comments on the 300 Area Proposed Plan & RI/FS:

1. **Protection of Yakama Nation treaty rights, including full access to cultural resources on the Hanford Site by the Yakama Nation:** Ensuring Treaty compliance is a critical intergovernmental concern. By and through this document, USDOE supports the participation of Yakama Nation in activities related to remediation and restoration of resources affected by Hanford and implements its trust responsibility and enforceable obligations to the Yakama Nation.
 - The Treaty, which reserves specific rights and resources for the Yakama Nation, should be acknowledged as an ARAR or a "must comply" standard for cleanup decisions. This includes the right to practice in full subsistence activities in Yakama usual and accustomed use areas. All future Interim and Final Record(s) of Decision(s) should be in harmony with treaty rights of the Yakama Nation under the Treaty of 1855 including upland treaty rights.

The YN ERWM program believes Preferred Alternative is not protective does not meet ARARs; is inconsistent with anticipated (*and feasible*) future land and groundwater use; and does not represent the maximum extent possible a permanent solution in a cost effective manner.

2. **Land Use:** Language in the Proposed Plan and selected Preferred Alternative indicates that DOE is not considering cleanup to unrestricted use and is striving toward a less stringent cleanup based on the Comprehensive Land-Use Plan (i.e. use of Method A-Industrial Standards vs. Method B-Unrestricted). While cleanup decisions may ultimately be defined by management boundaries, the risk assessment should be based upon actual human behaviors. The YN ERWM Program believes that all 300 Area cleanups should be to unrestricted use.
 - The final CLUP did not include any suggestions, or address any concerns provided by the Yakama Nation.¹

All potential impacts to treaty-reserved rights and resources should be thoroughly evaluated and considered in a revised RI/FS and Proposed Plan and supporting documents, including use of the Yakama Risk Scenario as the basis for setting cleanup levels.

The Preferred Alternative should be consistent with the USDOE's American Indian Policy, with the federal trust responsibility, and with the terms of the Treaty of 1855.

- The CLUP was a Federal undertaking that determined what type of activities could occur within the Hanford landscape, yet traditional cultural properties (TCP) were never addressed. Areas designated for industrial use, research and development, and conservation mining could have significant impacts on the landscape, and adversely affect a TCP should one be present.

¹ Yakama Nation letter to John Wagoner, Manager, Department of Energy, Richland Operations Office, June 30, 1998.

- As stated within the Proposed Plan, future land use as "Industrial" extends only *at least* (emphasis added) fourteen years into the future. This is inconsistent with the preferred remedy as the technology employed requires a longer period and there is acknowledged uncertainty in its success on the Hanford site.

The 618-11 Burial Ground is adjacent to the Energy Northwest parking lot areas where there is frequent "non-worker" public use. It is inappropriate to identify this site as continued "Industrial Use". *Unrestricted Use* should be the designation for this area.

Text throughout the Proposed Plan indicated a much longer span of time needed to insure remediation than discusses under each alternative particularly in the case of the long-lived radionuclides.

- Any additional remediation costs of the facilities currently in use should be included in an amendment to the ROD.
- All future and anticipated remediation costs should be included in the Alternatives' analysis.

- 3. Cultural Resources & Institutional Controls:** There is the assumption of and over-reliance on use of Institutional Controls to ensure protectiveness rather the primary objective which is protectiveness of the environment and human health through preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants, or contaminants as a principal element.

The philosophy underlying the cleanup of Hanford should be guided explicitly by the goal of allowing Native Peoples to safely live the lifestyle to which they are entitled. This way of thinking will be particularly important when considering how to incorporate non-quantitative elements into the Preferred Alternative such as the spiritual or cultural value of a site. The Yakama Nation has previously expressed deep concern in leaving in place large quantities of hazardous radiological and chemical wastes on the site with the long-term use of institutional controls as protective measures. This is specifically applicable to long-lived radionuclides such as uranium. DOE has acknowledged uranium is present throughout large sections of the vadose zone in the 300 Area, which will continue to impact groundwater quality. Within the timeframes that are realistically applicable (hundreds of millions of years for some radiological contaminants) institutional controls will inevitably fail, allowing fixture exposure to human health and the environment.

The YN expects a discussion of the culturally sensitive areas with reference to both historic and pre-contact Native American use within the Proposed Plan. Implied agreement with implementation of a ROD change rather than an MOA or outlining actions within the ROD is misleading to the public. The YN ERWM program request consultation with DOE on this issue. Use of institutional controls must be addressed in light of, and with appropriate deference to, Yakama Nation treaty and cultural rights which guarantee use of the land for specific purposes which are considered inseparable from the Yakama way of life.

- Regarding the use of institutional controls at DOE waste sites, the National Research Council pointed out: "While there is typically a tacit recognition

that engineered barriers and waste stabilization approaches have limited periods of effectiveness, these technologies are frequently employed with inadequate understanding of, or attention to, the factors that are critical to their success. These include the need for well-conceived plans for performance monitoring that identify and correct potential failures and plans for maintenance and repair, including possible total system replacement.” (NRC, 2000). This level of planning, both technical and financial (i.e., costs, does not appear to have been included in the analysis of alternatives).

- Currently, there are several projects and major decisions that will be made that effect the entire Hanford site, yet still a comprehensive TCP study has not been performed. Site wide undertakings and decisions such as clean up levels, restoration, vegetation management, land use plans, the use of barriers and institutional controls need to take into consideration the effects on TCPs.
- It is the obligation of DOE under the National Historic Preservation Act (NHPA), Section 106 to determine if their actions will adversely affect cultural resources. Any action that would limit access to a TCP, be ground disturbing, effect the viewshed, or in any way compromise the character defining features that make it eligible for listing on the National Register would be an adverse effect. According to the 36CFR 800 any adverse effect to a cultural site must be mitigated, usually through an MOA.
- Between the years, 2003-2011 approximately 1200 projects (85% of all projects) were completed under the classification of “no potential to cause effect”. This classification allowed DOE to complete these projects without a full Section 106 cultural review and without any consultation with YN. These projects have yet to be evaluated to determine if there is damage to significant cultural resources/TCPs. The small percentage of these projects YN has reviewed indicates a high percentage of projects had ground disturbance and some within already designated culturally sensitive areas. These remediation projects were out of compliance with NHPA. These projects should be mapped and evaluated to determine the overall impact. This information can then be used when evaluating Alternatives and what additional cultural evaluations will need to be performed.
- DOE is also obligated under NHPA, Section 110, to inventory and evaluate properties to determine eligibility under the agency’s jurisdiction. DOE has not been holding up to their Section 110 obligation of identifying cultural properties on the Hanford site. The Hanford Cultural Resource Management Plan (HCRMP) was finalized in 2003. In Chapter 3, Section 4.2.6 under purposed surveys it states “One TCP each year”, to date only two TCPs have been fully evaluated. It further states the need to continue to work with Tribal elders to identify TCPs. There are known TCP that have not been evaluated such as, White Bluffs, Coyote Rapids, the Columbia River, Wahluke Slope, as well as other potentially unknown TCPs in the Hanford area. Cultural properties are only being addressed through the Section 106 process, on a project by project basis, which is entirely ineffective.
- The HCRMP identifies the need for Tribal elder participation in identifying

TCPs and lays out a comprehensive method, separate from the Section 106 process. This piecemeal method through Section 106 does not allow for a comprehensive landscape study and does not allow for proper consultation with YN. None of the Alternatives were evaluated against the nine balancing criteria based on effects on TCP. A TCP study of the area must be completed to identify cultural properties so that the Alternatives can be properly evaluated to determine effects of the actions on the TCP. If it is determined any actions will adversely affect a TCP, the adverse effect must be mitigated in compliance with 36 CFR 800 and in compliance with NHP an ARAR of CERCLA. The MOA would need to be attached to the Record of Decision to show how DOE's action under the ROD will be in compliance.

- It is unclear what actions will be taken to ensure compliance with the Antiquities Act of 1906. Under the Antiquities Act of 1906, the Hanford Reach National Monument (HRNM) was created by Proclamation 7319 in 2000. The Proclamation lists the resources that are to be protected including: riparian, aquatic and upland shrub stepped habitats, native plant and animal species as well as archaeological, historic and sacred sites throughout the monument. While the majority of the HRNM is managed by USFWS, the river corridor lands underlying the Hanford reactors and operational areas are managed by DOE, the current land owner. These lands contain high levels of contamination and significant cultural resources.
- It is recognized in the Proclamation that DOE has the responsibility to clean up hazardous substances and the restoration of natural resources. The Proclamation further states, "As Department of Energy and US Fish and Wildlife Service determine that lands within the monument managed by the Department of Energy become suitable for management by the US Fish and Wildlife Service, the US Fish and Wildlife Service will assume management by agreement with the Department of Energy."
- Clearly it was the intent of the President that the HRNM land would be cleaned, restored and then managed by the USFWS. The entire HRNM would then be managed according to the mission of the USFWS guided by the HRNM Comprehensive Conservation Plan (CCP), which states a primary purpose of, "Protect and restore biological, cultural, geological and paleontological resources." Areas in the River Corridor 100 Areas are some of the most contaminated, and it remains the obligation of DOE to clean and restore these areas within the HRNM and areas that could affect the HRNM in consultation with the Department of Interior. Anything other than complete cleanup and restoration of the HRNM would be in direct conflict with the Antiquities Act, Proclamation 7319, and the HRNM CCP.
- Full compliance with government-to-government requirements are not fulfilled by the vague statements found in the Proposed Plan (pages 12/58): *"EPA also invited the Tribal Nations to participate in EPA's National Remedy Review Board review of this proposed cleanup action. In addition to these formal activities, DOE and EPA have worked with Tribal staff during the RI/FS process" or "The National Historic Preservation Act of 1966 is identified as a potential ARAR for remedial actions*

where cultural resources are present. The statement is made that remediation may have the potential to impact cultural resources, and that an analysis of cultural resource impacts will be taken before any remedial action occurs in the 300 Area. "

- The Proposed Plan and decision documents do not adequately resolve the concerns presented to the National Remedy Review Board regarding cultural resources and other areas of concern for the Yakama Nation.
- There is the assumption of and over-reliance on use of Institutional Controls to ensure protectiveness rather than the primary objective which is protectiveness of the environment and human health through preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants, or contaminants as a principal element.
 - The Preferred Alternative for groundwater with ICs for extended time periods is inconsistent with the CLUP (It is stated that cleanup actions will support reasonably anticipated future land uses consistent with the Hanford Reach National Monument and "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (the "CLUP") (HCP EIS) (64 FR 61615). CLUP is designated for 50 years operational and 100 years for institutional controls. Beyond that time period, the site could be used for any and all types of land use; including irrigation. It is known that there will be continued (occasional) but none the less, releases above cleanup levels for over 100 years; there will be a continued need for ICs.
 - It is unclear if ICs are in place only for the extent of the remedy or does the remedy include the ICs needed for areas of future RTD sites (e.g., the pipelines associated with current use facilities).
- The YN expects a discussion of the culturally sensitive areas with reference to both historic and precontact Native American use within the Proposed Plan. Implied agreement with implementation of a ROD change rather than an MOA or outlining actions within the ROD is misleading to the public. The YN requests consultation with DOE on this issue. Use of institutional controls must be addressed in light of, and with appropriate deference to, Yakama Nation treaty rights which guarantee use of the land for specific purposes which are considered inseparable from the Yakama way of life and with respect to unlimited/unrestricted access to TCPs and sacred sites.

4. Evaluation of the Proposed Plan and Preferred Alternative (3a): Key Concerns/Comments:

- The Proposed Plan for cleanup of the 300 Area and the associated RI/FS Report does not support an adequate cleanup of the 300 Area. While identified waste sites were/are no doubt heavily contaminated, the fact remains that significant quantities of uranium will remain unaddressed under the current Preferred Alternative (3a). DOE's approach intended to immobilize persistent high concentrations of uranium in the 300 Area vadose zone will not provide long term protection of groundwater since the contamination will remain in place. In order to achieve long-term protection of the Columbia River, contaminants will need to be removed from the vadose zone in the 300 Area. The described approach (polyphosphate treatment) has been demonstrated to be easily reversible, and does not remove the potential for future

remobilization or migration which is likely with changes in climate and/or river behavior.

- Selection of feasible alternatives for consideration did not consider RTD (to unrestricted use cleanup levels) of uranium in the deep vadose zone and PRZ where 80% of the uranium contamination resides (approximately 1ha (3ac) at the 316-5/300 APT, the SW quadrant of the North Process Pond's (316-2) effluent inlet, and 307 Disposal Trenches (316-3) waste sites). Along with the remedial components identified in the "Common Elements" section of the Proposed Plan, this remedy would score higher than the proposed Preferred Alternative in all of the Threshold & Balancing Criteria analysis factors, and it would be under the cost of Alternative #4 with the public assurance that the great majority of the Uranium (and possibly Cis-1,2- dichloroethene) contamination has been removed, and very high degree of certainty in performance and meeting and maintaining the RAOs. **At the very minimum, the YN ERWM program recommends this approach as the Preferred Alternative.**
- Alternative #3a's relies on the application of polyphosphate solution to deeper zones of uranium contamination for protection of groundwater. Polyphosphate remediation has been previously attempted in the 300 Area and has proven to be both problematic and ineffective (only approximately a 50% reduction in leaching). Although initial post-treatment uranium concentrations decreased to below the drinking water standard of 30 ug/L, a significant rebound in uranium concentration was observed approximately 2 months after treatment. In general, uranium performance monitoring results support the hypothesis that limited long-term treatment capacity (i.e., apatite formation) was established during the injection test.² The statement "*The efficacy of uranium sequestration by apatite assumes that the adsorbed uranium would subsequently convert to autunite, or other stable uranium phases. Because this appears to not be the case in the 300 Area aquifer, even in locations near the river, apatite may have limited efficacy for the retention and long-term immobilization of uranium at the 300 Area site*" further testifies to the inappropriateness of application of polyphosphate solution as a remedy.³
 - Problems associated with this technology have been previously identified during field trials in the 300 Area, including problems placing the reactive solution in contact with contaminated aquifer sediments due to high groundwater velocities; dispersion of reactive agents in groundwater rendering them ineffective to treat contamination in aquifer sediments; incompatibility with 300 Area aquifer geochemistry; and insufficient fine grained material in the Hanford Formation to retain and initiate precipitation of uranyl-phosphate mineral phases. PNNL has stated that "the ability to maintain low uranium concentration in the 300 Area unconfined aquifer over long periods of time using phosphate treatment of the saturated zone [appears] to be limited" (Vermeul et al., 2009). It is critical that the treatment identified in the preferred alternative be demonstrated to work, or include provisions to verify treatment has occurred as planned. The RI/FS should include a complete and credible

² PNNL-18529, 2009, 300 Area Uranium Stabilization Through Polyphosphate Injection: Final Report, Pacific Northwest National Laboratory, Richland, Washington. Available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-18529.pdf.

³ (PNNL-18529)

evaluation of polyphosphate treatment, including a discussion of the published failures and limitations that were identified by PNNL (2009).

- The Proposed Plan does not include explanations of how a 50 percent success rate is consistent with the statutory and NCP provisions regarding treatment (i.e. the preference for treatment to the maximum extent practicable; defined under NCP guidelines for *effective treatment as a 90 to 99 percent reduction in concentration*) as recommended by the National Remedy Review Board in 2012. Clarify how this Proposed Plan has met the NRRB recommendations regarding this issue.
 - As recommended by the National Remedy Review Board in 2012, it is unclear how physical and chemical analysis was performed to determine if enhanced transport of phosphate treated uranium particles (colloids) may reduce the effectiveness of the proposed remedy given the river's flux velocity of 50 feet/day in the 300 areas. Clarify how this Proposed Plan has met the NRRB recommendations regarding this issue.
- Alternative 3a incorporates treatments rated by the DOE to perform poorly against balancing criteria. Previous comments have identified the numerous deficiencies associated with the preferred alternative's application of polyphosphate to remediate uranium in the vadose zone in situ (see above). However, selection of Alternative 3 or 3a effectively incorporates Alternative 2 of the Proposed Plan as the de facto treatment, since this approach is to take no action to remediate vadose contamination by uranium. The performance of Alternative 2 evaluated against the balancing criteria includes "poor" ratings in both reduction of toxicity, mobility, or volume, and short term effectiveness. The Alternative 2 treatment is rated to perform only "moderately" for long term performance, and "very well" for implementability. While this Alternative is not explicitly selected as the Preferred Alternative by the Proposed Plan, we are concerned that it may ultimately be implemented after the application of polyphosphate solutions in the 300 Area fails to reduce vadose zone contamination volume, mobility, or toxicity and contingent or additional remedial actions are not applied.

This reliance on monitored natural attenuation to remediate groundwater in the 300 Area is the same remedial action selected as in the 1992 interim ROD for the 300-FF-5 Operable Unit, which has failed to perform as intended. The RI/FS completed for the 1996 ROD predicted that groundwater standards would be achieved no later than 2002 (EPA, 1996). It is apparent that after more than 20 years, reliance on the Columbia River to essentially flush uranium out of the vadose and periodically rewetted zones has not proven to be effective.

Intentionally selecting a remedial alternative (Alternative 3a) that is known to be ineffective as a means to ultimately implement an alternative that requires no additional action be taken (Alternative 2) seems misleading and misguided in terms of protecting human health and the environment, a primary objective of remediation.

- The Preferred Alternative (3a) (and Proposed Plan) lacks required information: The Preferred Alternative (or Proposed Plan) does not include the required description of the contingency measures that will be implemented should the monitoring show that natural attenuation is unable to achieve the cleanup goals. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-

98-031). The Proposed Plan and Preferred Alternative should incorporate remedial actions that will meet these thresholds and state explicitly the contingency measures and additional actions that will be taken should CERCLA monitoring demonstrate the Preferred Alternative has not worked as planned. Provide details in the Proposed Plan for public review including cost of implantation of contingency measures.

- The YN ERWM program request DOE update and provide details in the Proposed Plan for public review including cost of implantation of contingency measures.
- EPA guidance on Monitored Natural Attenuation states a plume should be stable and all mechanisms clearly identified to appropriately consider as a MNA remedy. Explanations in the Proposed Plan clearly indicate the plumes for all COCs for which MNA is applied are not stable and could easily be affected by unanticipated yet potential changes in river levels or as the result of application of unproven technologies (Cis-1, 2-dichlorethene contamination appears to be moving towards the river at levels exceeding DWS). Clarify how this Proposed Plan has met the NRRB recommendations regarding this issue.
- There is no description/clarification of likely requests for waivers as required by CERCLA within the Proposed Plan.
 - In a letter dated August 3, 2012 the DOE Richland Office replied to a letter of recommendations provided by the Hanford Advisory Board regarding the 300 Area RI/FS and Proposed Plan remedial alternatives. Text included in the August 3, 2012 letter stating that the DOE is already pursuing the application of the National Contingency Plan to wave “applicable or relevant and appropriate requirements,” which appears to indicate that the DOE does not anticipate the Preferred Alternative will be effective in meeting the ARARs for the cleanup.
 - USDOE correspondence (12-AMCP-0085, March 26, 2013) with the National Remedy Review Board discusses the technical challenges in the development and implementation of a strategy to protect and restore the aquifer impacted by the residual uranium and definitively states DOE/RL will not support a deep RTD option despite both Ecology and stakeholders position that ‘Remove-Treat-Dispose (RTD) options are preferred. The correspondence continues to state that while DOE/RL has not sought an applicable or relevant and appropriate requirement wavier for the uranium plume in portions of the 300 Area, *it is their view that the basis for such a wavier is clearly presented in the 300 Area Feasibility Study.* (emphasis added)
 - RL identified the requirement for clear performance benchmarks to be agreed to and identified in the Proposed Plan and ROD that provides for a natural attenuation remedy if these are not achieved. These benchmarks are not within the 300 Area Proposed Plan.
- In the event that the polyphosphate application does not reduce the mobility of uranium in the deep subsurface, the proposed alternative specifies that no additional treatment will be applied. The Proposed Plan and Preferred Alternative should incorporate remedial actions that will meet these thresholds and state explicitly the contingency measures and additional actions that will be taken should CERCLA monitoring demonstrate the Preferred Alternative has not worked as planned.

- Reliance on monitored natural attenuation to remediate groundwater in the 300 Area is the same remedial action selected as in the 1992 interim ROD for the 300-FF-5 Operable Unit, which has failed to perform as intended. The RI/FS completed for the 1996 ROD predicted that groundwater standards would be achieved no later than 2002 (EPA, 1996). It is apparent that after more than 20 years, reliance on the Columbia River to essentially flush uranium out of the vadose and periodically rewetted zones has not proven to be effective. Intentionally selecting a remedial alternative (Alternative 3a) that is known to be ineffective as a means to ultimately implement an alternative that requires no additional action be taken (Alternative 2) seems misleading and misguided in terms of protecting human health and the environment, a primary objective of remediation.
- The Preferred Alternative does not include quality assurance measures. Application of polyphosphate solution to soils in the 300 Area has been demonstrated by PNNL not to be effective or consistent in reducing toxicity, mobility, and volume of contamination (PNNL, 2008; PNNL, 2009). Previous field tests using polyphosphate solution in an attempt to remediate subsurface remediation have experienced significant problems achieving appropriate contact time between contaminated media and the reactive agent due to the high hydraulic conductivity of the unconfined aquifer, and similarly high groundwater velocities. These problems notwithstanding, the preferred remedial alternative's application of phosphate solution to the 300 Area subsurface does not include a program of drilling and chemical testing in the infiltration and injection areas to verify reagent placement. The preferred remedial alternative therefore has no quality assurance measures to ensure the remedial action has been implemented as planned, and no standard against which to judge its performance. The Proposed Plan should include a detailed description of quality assurance measures that will be implemented as part of the preferred alternative's use of polyphosphate sequestration. The description should include a program of subsurface testing to ensure placement of reagents, as well as identify performance standards which the alternative must achieve before the reagents are applied in the field.
- Alternative #3 *design details* will be identified in the RDR/RAWP to be prepared after the ROD is issued. EPA guidance (EPA 540-R-98-031) states this information should be included in both the Preferred Alternative Section of the Proposed Plan and the Selected Remedy Section of the ROD, not in the workplan. The YN ERWM program request DOE update and provide details in the Proposed Plan for public review.
- Table 3: *Summary of Comparative Analysis of Alternatives*: We believe the weight applied to ranking of the effectiveness of the alternatives to be incorrect. There is obvious discrepancy in the rating of Alternative #4 as having less *Long-term effectiveness and permanence* and less *Reduction of toxicity, mobility, or volume through treatment* or *Short-term effectiveness and time to achieve RAOs* in comparison with Alternative 3a. While cost for waste sites is less under Alternatives #s 3or 3a (with considerable uncertainty as this is an unproven technology for the

Hanford site), Alternative 4 admittedly and assuredly takes less time, removes a great portion of the source waste, and has equal reduction of mobility of a specific areas as both 3 & 3a.

- Use of Remedial Action Objectives (RAOs): The purpose of RAOs is to explain and address site risks and to include an action (and specifics/details) to be taken achieve the objective. RAOs are the measurement tools for evaluating the success of the ROD remedy during the CERCLA 5 year review process. Without a specific action, the metrics for measurement are filled with subjectivity and uncertainty.
 - None of the seven (7) RAOs have a definitive task or standard to be met. An Example of a specific action to include using RAO#2: Prevent COCs migrating and/or leaching to surface water *by treatment of the contaminated soils or RTD.*
 - Clarify all RAOs with specific action(s) to be performed and/or standard(s) to be met.
- Alternative #3a: It is uncertain that 'enhanced uranium attenuation' is a sustainable technology. Granted it does reduce mobility but it does nothing to reduce toxicity, concentration, or volumes. Clarify how this technology will demonstrate it is a sustainable technology that will last until no longer required.
 - Clarify how many years it will be before deep excavation (below 15ft) in uranium sequestration areas could be possible without risk to human health and the environment (i.e., exceedence of cleanup standards).
 - Include a discussion of the rationale for the placement of injection wells. Clarify why there are no interiorly located wells.
 - Clarify if short-term effectiveness evaluations for all alternatives were based on only the time to build/implement the remedy or if it includes the time to achieve all remedial action PRGs.
 - Clarify what is meant by 'a sufficient time to produce a stable uranium mineral' as used in the evaluation of the short-term effectiveness of Alternatives # 3 & 3a (top of pg 62).
 - Clarify how #3 & 3a have the highest short-term effectiveness as they do not extend the remediation time frame beyond the time required for the waste sites. Both #4 & 5 take less time to achieve PRGs for uranium in the GW than #3 or 3a.
 - Exposure pathways to contaminated media have been documented to be complete. Both the Proposed Plan and the RI/FS assert that there are "no complete exposure pathways for risk to human populations" based on the formally designated land use and existing institutional controls. However, this statement is contradicted by DOE's own description of the 300 Area as the "site of potential exposure of contaminants carried by groundwater include the riverbed substrate, and riverbank springs that appear during periods of low stage." The seeps are monitored by the DOE's Public Safety and Resource Protection Program. The Preferred Alternative does not address remediation of this complete pathway. Nor does it provide documentation on how DOE's Public Safety and Resource Protection Program is capable of taking the necessary actions to ensure remediation if necessary. This information should be included in the Proposed Plan for public review.

General Comments on the Analysis of the Alternatives:

- Evaluation of alternatives in the Proposed Plan is not realistic or credible. The performance problems associated with Alternatives 3 and 3a are not realistically and accurately evaluated according to CERCLA criteria when compared against Alternatives 4 and 5, which feature more extensive excavation of contaminated areas to permanently remove, treat, and dispose of uranium contaminated soils. Specifically, Alternatives 3 and 3a, both of which feature polyphosphate treatment as a primary form of remediation for the subsurface beyond 15 feet in depth, are rated to be more effective in short-term effectiveness, reduction of toxicity, mobility, and volume, and implementability than Alternatives 4 and 5. In Table 3 (p. 56) of the Proposed Plan both Alternatives 4 and 5 are identified as achieving RAOs for uranium in groundwater before Alternatives 3 and 3a by a margin that ranges from 5 to 11 years. The analysis to assign such ratings should be revised.
- DOE implicitly acknowledges on page 45 of the Proposed Plan, stating “phosphate will be injected into the upper portion of the groundwater to attempt to sequester uranium potentially mobilized by the surface infiltration and [periodically rewetted zone] injection.” Given the already well documented deficiencies of polyphosphate to permanently sequester uranium in the 300 Area under both unsaturated and saturated conditions, this double standard applied in favor of polyphosphate treatment is particularly inappropriate. There are several additional examples that suggest the evaluation of alternatives was biased including:
 - Assertion that Alternatives 3 and 3a are more effective than Alternatives 4 and 5 on the basis that they will result in the direct formation of autunite; a result that has specifically been identified as not occurring and not proving to be an effective remedial alternative by PNNL (2009).
 - Explicit discussion of Alternatives 3 and 3a “reducing mobility” of uranium in the treated area even though both RTD alternatives also permanently reduce mobility of uranium by taking it out of the periodically rewetted zone and vadose zone.
 - Discounting of the uncertainties associated with delivering phosphate solution to the zones of uranium contamination in the deep vadose zone and periodically rewetted zone. These problems are well documented, and have also been linked with relative increases in hydraulic conductivity of contaminated sediments following application of polyphosphate solution (PNNL, 2009).
 - Rating polyphosphate alternatives above monitored natural attenuation (Alternative 2) while failing to acknowledge that polyphosphate-solution treatments have proven to be ineffective in the past; have not been demonstrated to be successful on a field scale in the 300 Area; and that monitored natural attenuation may be de facto implemented after the phosphate treatments are applied.

The DOE should perform credible evaluation of alternatives for the Proposed Plan, include all relevant information regarding pilot study performance results, complications, known limitations, and commonalities as part of the evaluation of alternatives, and should identify common elements such as the reduction of mobility in the vadose zone that results from removing contaminants to provide for a complete evaluation.
- Presentation of polyphosphate remedial actions is misleading and inaccurate. The Proposed Plan states that phosphate injection that will be performed to remediate the

vadose zone has been tested in a pilot study and that "uranium concentrations within 23 [meters] of the pilot study injection well decreased below the drinking water standard from autunite formation." However, review of the full report that was referenced by the DOE, 300 Area Uranium Stabilization through Polyphosphate Injection: Final Report (PNNL-18529, 2009) found that the full conclusion stated:

- Although initial post-treatment uranium concentrations decreased to below the drinking water standard of 30 ug/L, a significant rebound in uranium concentration was observed approximately two months after treatment. In general, uranium performance monitoring results support the hypothesis that limited long-term treatment capacity (i.e. apatite formation) was established during the injection test. (Emphasis added).
- The text in the Proposed Plan is misleading and incomplete in its assessment of the polyphosphate treatment identified for Alternatives 3 and 3a. These deficiencies are further compounded by several additional factors that include inaccurate evaluation of short-term effectiveness, reduction of toxicity, mobility, and volume, and implementability. The RI/FS should include a complete and credible evaluation of polyphosphate treatment, including a discussion of the published failures and limitations that were identified by PNNL (2009).
- The Preferred Alternative incorporates treatments rated by the DOE to perform poorly against balancing criteria. Previous comments have identified the numerous deficiencies associated with the preferred alternative's application of polyphosphate to remediate uranium in the vadose zone in situ (see above). However, selection of Alternative 3 or 3a effectively incorporates Alternative 2 of the Proposed Plan as the de facto treatment, since this approach is to take no action to remediate vadose contamination by uranium. The performance of Alternative 2 evaluated against the balancing criteria includes "poor" ratings in both reduction of toxicity, mobility, or volume, and short term effectiveness. The Alternative 2 treatment is rated to perform only "moderately" for long term performance, and "very well" for implementability. While this Alternative is not explicitly selected as the Preferred Alternative by the Proposed Plan, we are concerned that it may ultimately be implemented after the application of polyphosphate solutions in the 300 Area fails to reduce vadose zone contamination volume, mobility, or toxicity and contingent or additional remedial actions are not applied.
- Design elements for Alternatives selection should be described in sufficient detail in the Proposed Plan so that the public can evaluate and comment on the proposal (EPA 540-R-98-031). The Proposed Plan provides the foundation for the ROD to defer the final technology selection to the remedial design phase. (See Table 3 Note: Although the remedial alternatives developed for evaluation do not have specific provisions for sustainable elements, those values can be incorporated during the remedial design phase.)
- Clarify in the discussion of the Alternatives 2, 3, 3a, 4, and 5 how treatment for identified long-lived TRU radionuclides of plutonium and americium and cesium-137 and strontium-90 is included as stated elsewhere in the Proposed Plan.
- Clarify if any of the Alternatives were evaluated against the nine balancing criteria based on what happens with transition to Long-term Stewardship prior to completion of remediation under the Record of Decision (e.g., Clarify if a cost benefit analysis of

remedy costs including long-term stewardship costs was done.) The environmental consequences of doing this action or not doing it have not been evaluated. Clarify how any of the Alternatives can ensure compliance with the balancing criteria with transition into Long-term Stewardship. These analyses should be done as this action will clearly need to be reflected and integrated into the final ROD. The YN ERWM program request DOE update and provide details in the Proposed Plan for public review.

- Soil contamination should be documented in both vertical and horizontal directions from all potential sources (*EPA/540/G-89/004-Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*). Clarify how the discovery of cesium-137 and strontium-90 contamination below the 324 and the recent addition of the uranium plume from the 618-7 burial ground were included in the characterization efforts. Clarification is needed. The YN ERWM program request DOE update and provide details in the Proposed Plan for public review including cost of implantation of any contingency measures.
 - Evaluation of remedial alternatives against balancing criteria is not reasonable, credible, or acceptable. The problems previously identified with the preferred alternative treatment to protect groundwater are generally dismissed by the Proposed Plan with the statements similar to "previous tests performed in the vadose zone and [periodically rewetted zone] were promising, but did not positively demonstrate the viability of this technology for large area application" (DOE, 2011e, page 45).
 - This statement implicitly confirms that the polyphosphate treatment identified has not been evaluated according to the applicable CERCLA balancing criteria, which require the selected treatment's *performance at the site* be compared against other alternative's performance at the site. The rating of remedial alternatives against balancing criteria that has been performed does not reflect an honest and unbiased evaluation.
 - Discussion of the 'unintended consequences', etc, of deep RTD should be included in the description of the appropriate Alternatives, not within the evaluation of short-term effectiveness. Quantified data has not been incorporated into the Alternatives #4 & 5 to support the assumption that deep excavation to remove the majority of Uranium (~80%) will release significant contamination to the groundwater or the Columbia River.
 - Discussions of significant funding and building of ERDF infrastructure is an associated element of the 300 Area RI/FS/PP processes, however DOE has not provided related cost estimates or how ERDF costs are managed (e.g., clarify whether ERFD costs are projected under a separate decision).
 - Identify the three waste sites needing additional remedial actions under the 300-FF-1 OU ROD. Clarify the amendment process to the original ROD; clarify how this action is to be captured under the final ROD for the 300-FF-1, 300-FF-2, and 300-FF-5 OUs. (pg4/PP)
5. **Groundwater:** Data collected in the Columbia River shows pore water uranium concentrations that exceed regulatory criteria (more than four times the Federal drinking water standard).

We remain concerned the health of Yakama Nation tribal members with the needed extensive remediation of the groundwater as there will be continued effects and potential new COCs from the 200 Area which are not considered in this Proposed Plan. CERCLA asks that all *primary sources* of contamination be included in RI/FS evaluations. Groundwater is not generally considered a primary source, yet as upland plumes enter the river, the YN ERWM Program are concerned that any remedy reviews will not include actual sampling actions or technological systems review to confirm performance or to consider these missing source area contaminants.

- Regardless of the source of groundwater contamination, all COCs should be evaluated. Consideration of all sources of contamination is a requirement of the Dangerous Waste Regulations which is an ARAR to the 300-FF-1, 2, & 5 ROD.
- The YN ERWM Program request EPA use of the new RfD value (0.0006) for Uranium by EPA's Office of Drinking Water as the basis of the Maximum Contaminant Level for drinking water is noted in the Tri-Party approved comment resolution document attached to DOE letter (13-AMRP-0041) to EPA and Ecology, 11/21/2012.
- The Preferred Alternative appears to jeopardize the successful completion of several TPA milestones: M-016-00: 09/30/2024: (Complete remedial actions for all non-tank farm and non-canyon operable units. This includes groundwater remediation.); M-016-00A: 03/31/2017: M-016-110-T04: 2/31/2016.
- Table 1 list the Principal Risk Driver COCs for the Vadose Zone for the 300-FF-1 & 2 OU yet Uranium is seemingly the only COC that will be addressed by the Preferred Alternative. Clarify how these principal risk drivers to the groundwater are being remediated and demonstrate (using travel times, etc) that contamination from these COCs will be prevented downstream and/or from reaching the river in exceedence of the DWS, MCLs, AWQS.
 - The YNERWM Program disagrees with the application of several footnotes identified in Table A-1 & A-2:
 - i. Table A-1 states highly mobile contaminants ($K_d < 2$) the model assumes the entire vadose zone is contaminated (100%) for $K_d > 2$, the ratio is 70/30%. Contaminants with a K_d of 2 are still highly mobile. The YN ERWM program request justification and data from the vadose zone to support modeling assumptions.
 - ii. The YN ERWM Program question the values for Uranium, Nitrate, and Toluene listed in Table A-1 and request additional clarification on how these were attained.
 - iii. The *Note* on Table A-1 states additional COCs for the 618-10 & 618-11 burial grounds will be identified in the remedial design report/remedial action work plan. CERCLA requires all sources and their contaminants be identified within the alternatives section. Additional information is requested (including additional characterization as necessary).
 - iv. Table A-1, footnote (j) indicates the hexavalent chromium PRG is based on IROD cleanup levels (DOE/RL-96-17).
 - v. Table A-2, footnote (b) cites use of values from the IRIS database. However Table 4-1 of the Addendum to the 300 Area RI/FS reflects the revisions associated with updates to toxicity values and elimination of secondary maximum contaminant level (MCLs) as a

chemical-specific ARAR. The Groundwater Method B Unrestricted Land Use values stated for both COCs are listed as 16 & 0.95 ug/L respectively. Table A-2 of the Proposed Plan needs to reflect these more stringent values. Edit Proposed Remediation Goals (PRGs) to reflect these values.⁴

- vi. Table A-1 list 30ug/L as the Drinking Water Standard and the proposed PRG. However, MEMO (EPA –Region 10, August 7, 2008) recommends use of the Reference Dose (RfD) developed by the Office of Water for the Maximum Contaminant Level (MCL) for uranium in the human health risk assessment for the Hanford Nuclear Reservation NPL site in place of the RfD developed by the Integrated Risk Information System (IRIS) for soluble salts of uranium (2000; U.S. Environmental Protection Agency & U.S. Geological Survey, 2000). After calculations, this equates to a groundwater cleanup level of ~10ug/L.
 - vii. The YN ERWM program request the PRG cleanup level be changed to reflect use of the new RfD value as promulgated by EPA and the cleanup level under MTCA of 10ug/L for Uranium in the groundwater.
- The YN ERWM program remains concerned the health of Yakama Nation tribal members with the needed extensive remediation of the groundwater as there will be continued effects and potential new COCs from the 200 Area which are not considered in this Proposed Plan. CERCLA asks that all *primary sources* of contamination be included in RI/FS evaluations. Groundwater is not generally considered a primary source, yet as upland plumes enter the river, the YN ERWM Program are concerned that any remedy reviews will not include actual sampling actions or technological systems review to confirm performance or to consider these missing source area contaminants.
 - Uranium migration from the Central Plateau into the River Corridor groundwater is expected to continue and to remain in excess of the present drinking water limit of 30 micrograms per liter for about 2,000 years.⁵
 - Contamination in the Central Plateau is currently migrating to groundwater through the highly complex vadose zone. In the 200-UP-1 Remedial Action Objective (RAO) #3, DOE acknowledges the need to *protect the Columbia River and its ecological resources from degradation and unacceptable impact caused by contaminants migrating from 200-UP-1 (DOE, 2010b)*. This contaminated groundwater from the Central Plateau is being transported to the River Corridor and has already reached the Columbia River; this will continue far into the future, as shown by DOE's own modeling. DOE should consider contaminant migration in groundwater over time from the Central Plateau to the River Corridor and ultimately the Columbia River, including groundwater flow rates, plume mixing, and exposure pathways, and incorporate this information into the decision documents for the River Corridor.
 - Remediation of contaminants from the 200-PO-1 OU will be years in the future. (M-015-21A 06/30/2015 is the due date to submit initial documents for approval, not to

⁴ "First Sulfate Restriction Issued in AZ Mine Permit," pg. 14, *Southwest HYDROLOGY*, Vol. 6/Number 6: November/December 2007.

⁵ DOE 2009, Vol. 2, Figure U-9, p. U-9.

initiate the actual remediation efforts). The 200-PO-1COCs that exceed Groundwater or River protection standards are within the same aquifer. By their inter-connectedness, the lack of current remediation of these contaminants, and to ensure continuity of the Hanford site groundwater remediation efforts, these COCs should be included in the 300-FF-5 ROD GW remediation plan. Discussion is needed to demonstrate (using travel times, etc) that the contamination reportedly originating from the 200-PO-1 is prevented from exceeding the DWS, MCLs, AWQS downstream and/or reaching the river. Otherwise, the ROD must include a remedy for all these constituents: COC Example: I-129 (e.g., Remedy: resins to treat the I-129).

- Include discussion of the levels of Tech-99 & I-129 in the 300-FF-5 groundwater operable unit.
 - Table 1 list the Principal Risk Driver COCs for the Vadose Zone for the 300-FF-1 & 2 OU yet Uranium is seemingly the only COC that will be addressed by the Preferred Alternative. Clarify how these principal risk drivers to the groundwater are being remediated and demonstrate (using travel times, etc) that contamination from these COCs will be prevented downstream and/or from reaching the river in exceedence of the DWS, MCLs, AWQS.
- The Proposed Plan lacks treatment for Cis-1, 2-dichlorethene and TCE (DNAPL) contaminants. Both which exceed DWS. Cis-1, 2-dichlorethene contamination appears to be moving towards the river at levels exceeding DWS.
- Table 4-1 of the Addendum to the 300 Area RI/FS reflects the revisions associated with updates to toxicity values and elimination of secondary maximum contaminant level (MCLs) as a chemical-specific ARAR. The Groundwater Method B Unrestricted Land Use values stated for both COCs are listed as 16 & 0.95 ug/L respectively. Table A-2 of the Proposed Plan needs to reflect these more stringent values. Edit Proposed Remediation Goals (PRGs) to reflect these values.
 - Clarify why DOE is justified in not providing a remedy to include remediation of these contaminations. TCE (considered a DNAPL) maybe viewed as a source material (USEPA, 1991b; OSWER Directive # 9200.4-17p). Remediation for TCE and cis-1, 2-dichloroethene should be included in the Preferred Alternative. There are several different employable techniques for separating the organic chemicals which been successful employed in other groundwater cleanups and could be applied at Hanford. The technologies that may ultimately be selected and the timing and criteria for the future technology selection should be described in sufficient detail in the Proposed Plan so that the public can evaluate and comment on the proposal (EPA 540-R-98-031).
 - The Preferred Alternative (or Proposed Plan) does not include the required description of the contingency measures that will be implemented should the monitoring show that natural attenuation is unable to achieve the cleanup goals. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-98-031). Update and provide details in the Proposed Plan for public review including cost of implantation of contingency measures.
 - Uranium was detected at a maximum concentration of 70ug/L in a 300 Area seep (DOE/RL-2011-01, Rev.0). The river shoreline and hyporheic zone cleanup levels should ensure the more stringent values of either the DWS or

ambient water quality standards. More clarification is needed in the Proposed Plan, how Uranium contaminants in the 300 Area seeps do not exceed ecological protection federal or state standards (i.e. provide reference in RI/FS where this is demonstrated).

- Clarify if the oxidation of uranium to form autunite will affect the natural attenuation /biodegradation process of TCE and/or cis-1,2-dichloroethene. Include discussion in Proposed Plan/Preferred Alternative.
 - As Tribal members, YN looks at groundwater as a cultural resource and in a more holistic way as all water is the sacred lifeblood of the people. We disagree with the removal of secondary maximum contaminant levels as a chemical-specific ARAR for the specific purpose of maintaining not only the groundwater's quality but also aesthetic qualities. Include these secondary maximum contaminant levels as a chemical-specific ARAR and all previously eliminated COCs.
- The Preferred Alternative lacks a remedy for Nitrates. Exclusion of any Nitrate remediation of the groundwater is unfounded. Final comment disposition/resolution of Ecology's general comment #6 regarding the Columbia River Component Risk Assessment, Volume II, Parts 1 and 2, Baseline Human Health Risk Assessment, DOE/RL-2010-117, Rev. 0, (13-AMRP-0041; 11/21/2012) indicate agreement that the large concentrations of nitrate in the surface water and the high concentration of phosphorous in the sediment at the outfall are from a Hanford source (specifically the 331 Life Sciences Laboratory). Additionally, Nitrate concentrations not only exceed DWS (45mg/L) in the southern portion of the OU, but also down gradient from the 618-11 burial ground. Furthermore, several unplanned releases of Uranium-bearing nitric acids combined with either sulfuric acid or copper or other compounds have been identified.⁶
- Caution is appropriate if young children might be exposed, such as in the Nonresident Tribal scenario, because they are particularly at risk for methemoglobinemia, the critical effect for nitrate exposure (IRIS 2009).

The statement that there is not a good environment for biodegradation in the 300 Area to warrant the use of an Apatite barrier to capture the 300 Area Sr-90 plume is inconsistent to its application in the 100-N area. This technique should have been a part of the "Common Elements" of the Alternatives. Include this in the evaluation of all Alternatives.

- YN ERWM program questions the rationale that dust suppressant applications are prohibitive or would drive excessive amounts of Uranium into the groundwater/river above DWS to the exclusion of selection of the most viable Alternative. Quantify the amount of increase in Uranium concentration in wells downstream of the 618-10 & 316-4 waste sites due solely to dust suppressant water.
- Clarify the need for an additional evaluation of HH ELCR and hazards were performed when MTCA Method B would suffice.
- Exposure Point Concentrations (EPCs) were used to calculate the ELCRS and noncancer hazards. Clarify the "thresholds" established by EPA & Ecology. Frequently these EPCs resulted in deletion of COCs when used to compare COCs against the applicable standard or risk-based concentration.

⁶ BHI-01164, 300 Area Process Trenches Verification Package, Appendix A.

- Clarify what was the process used to validate the results from which the EPCs were derived.
 - Please refer to our prior discussions of EPCs in response letter to Hanford Risk Assessments, etc.
- Calculation of radionuclide PRGs based on use of a risk ELCRs of a 1 in 10,000 risk or radionuclide dose (15 mrem/year) is in opposition the EPA guidance which states the point of departure for risk is 1 in a million. The allowable target risk range is 1×10^{-4} to 1×10^{-6} but DOE continues to drive cleanup with the lowest level rather than initially striving to meet the highest standard of 1 in a million (1×10^{-6}). 1×10^{-6} is consistent with MTCA (WA States regulations) and it should be DOE's cleanup goal.⁷ As MTCA explicitly defines radionuclides as hazardous substances, the combined limit for radionuclides and chemicals should correspond to a lifetime cancer risk of 1×10^{-5} or less at the very least.
 - Years to attain mature plant revegetation is more correctly identified as a range of 80 to 100 years Recalculate infiltration rates using this more appropriate range of years. Adjust Alternatives to incorporate these values to reflect a more accurate timeline in achieving remediation goals.
 - Cleanup levels (i.e., PRGs) should reflect the current MTCA Method B standards and in cases where they are less stringent than before, there should be no back-sliding from previous cleanup commitments in the PP.
 - More clarification is needed on how cleanup levels will be adjusted to account for waste site-specific residual contaminations and for sites with multiple residual contaminants. The same is needed for evaluation of groundwater exceedances.

6. Contaminant Fate and Transport Modeling:

- Federal DWS/MCL is currently listed as 30ug/L for Uranium. However, MEMO (EPA –Region 10, August 7, 2008) recommends use of the Reference Dose (RfD) developed by the Office of Water for the Maximum Contaminant Level (MCL) for uranium in the human health risk assessment for the Hanford Nuclear Reservation NPL site in place of the RfD developed by the Integrated Risk Information System (IRIS) for soluble salts of uranium (2000; U.S. Environmental Protection Agency & U.S. Geological Survey, 2000). This equates to a groundwater cleanup level of ~10ug/L. The YN ERWM Program request 10ug/L to be use as the cleanup level.
- Include a figure depicting all COCs groundwater plumes. Create a figure for the 300-FF-5 OU plumes similar to Figure 5. (Figure 11 does not demonstrate the entire groundwater plumes of the 300-FF-5 OU.)

⁷ The 15 millirem per year (mrem/yr) dose limit used by DOE in the past is not protective enough; this dose equates to a lifetime cancer risk of 3×10^{-4} , which is three times the maximum allowable value under CERCLA. Note: If the EPA's own risk coefficients for radiation are used, it equates to a fatal cancer risk of more than 5×10^{-4} and a cancer incidence risk of 1×10^{-3} , which is well outside the CERCLA target range of 10^{-4} to 10^{-6} .)

- Table 2-1. Data Needs and Sampling Program for the 300 Area Remedial Investigation indicate the treatability tests to date have not demonstrated a successful delivery mechanism for polyphosphate.
- Clarify in the Proposed Plan what is meant by “continued discharge of relatively low uranium concentrations to the river” (pg 14/PP). The YN ERWM Program believes these low concentrations are the result of dilution rather than appropriate treatment.
- Clarify in the Proposed Plan how the *lateral extent of the PRZ limits the effectiveness of deep excavation* as a remedy other than cost considerations.
- Section on Waste Site Contamination is confusing to the reader. References to burial grounds are repeated with different intent to the explanations. Include a figure with all sites under discussion. Figures 9 & 10 do not suffice; rather they add confusion.

General Fate and Transport Modeling, PRG Development comments:

- Many simplifying assumptions have been incorporated into the uranium transport modeling that makes the results highly uncertain. Uranium transport modeling in the 300 Area has been performed to support remedial alternative evaluation as part of the RI/FS Report and Proposed Plan. There are several overly simplifying assumptions that are incorporated into the transport model. Some of these assumptions include:
 - Significant simplification of local geology.
 - Assumed hydrologic boundary conditions in the past and future (10-, 50-, and 100- year events have been eliminated, resulting in a restricted set of river stages applied repeatedly).
 - Simplified calculation of partition coefficients that may not reflect actual uranium behavior.
 - Simplified hydrologic regimes in the Columbia River and restricted flow paths for hyporheic water and groundwater.
 - Simplified initial distributions of uranium, which included assigning values derived from cleanup verification package data to one of two depths, and extrapolating between data points.
 - Assumed sorption/desorption behavior of uranium under dynamic flow conditions.
- While model runs can be compared against observed values for a portion of the domain, ultimately the results must be viewed as only one possible outcome that may occur in the future depending on environmental variables and remedial actions. The DOE should incorporate the uncertainty and consider the associated reductions in alternative performance that may result from changes in environmental variables into the evaluation of CERCLA balancing criteria. Where sensitivity analysis has not been performed, performance uncertainty should count against the long term effectiveness of remedial alternatives that leave uranium in the vadose and periodically rewetted zones.
- Uranium transport modeling boundary conditions are not realistic for the remedial alternative performance time period. Hydrologic boundary conditions for the uranium transport model specified in Appendix F were constructed using data from relatively short periods of time (e.g., 1 year for the river side lateral boundary) that are then repeated over the performance period of the model (3,000 years). This

approach does not capture the impact of 10-, 50-, 100-, or 1,000-year events which include unusually high discharges, heavy rainfall, and other infrequent events. Such events are likely to inundate higher portions of the vadose zone than flows during a typical year. The hydrologic boundary conditions should include a greater range of groundwater and river stages that ensure unusual and infrequent events are considered as part of remedial alternative performance evaluations.

- Uranium transport modeling transects do not characterize areas of highest contamination. Modeling of uranium transport in the subsurface as part of PRG development should be performed at locations where maximum contamination is expected to occur. The current 2-dimensional transect alignments are located orthogonal to inferred flow paths down gradient from waste sites known to have residual contamination that is more than 10 times the identified background concentration. Dilution of labile constituents is known to occur with transport, making the transect positioning used sub-optimal for determining the concentrations of uranium in groundwater following remedial actions. Additional transect results should be added to the RI/FS Report that include areas of greatest soil contamination for each of the proposed remedial alternatives to provide appropriate evaluation of their performance.
- Uranium transport modeling assumptions are biased to favor polyphosphate treatment. Modeled attenuation of the groundwater plume evaluates the preferred alternative's performance by removing portions of the uranium source from the vadose and periodically rewetted zones; this would not occur as part of the polyphosphate treatment. Additionally PNNL (2009) has indicated that sequestered uranium may easily be remobilized. Removing portions of the source term would be appropriate for Alternatives 4 or 5, but should not be used for Alternatives 3 or 3a. Using this approach to evaluate the efficacy of the polyphosphate treatments is not appropriate or realistic in light of the previous field tests and published results. Using such an assumption constitutes a deficient analysis that is biased and creates the impression that the Preferred Alternative will perform better than is realistically expected, requiring lower capital expenditures and fewer environmental impacts. The uranium transport modeling should evaluate remedial alternative performance that realistically leaves the source term uranium in place as is contemplated by DOE for polyphosphate treatment, and removes uranium for RTD alternatives. Polyphosphate modeling should incorporate the observed remobilization of uranium following the treatments as was described in PNNL-18529 and the findings of these analyses should be incorporated into the evaluation.
- Infiltration scenarios used in PRG development are not appropriate. Infiltration scenarios used for the post closure period are not well justified, and do not represent a realistic set of site conditions under which the selected remedial alternative will perform. PRG infiltration scenarios are based on very low rates of infiltration identified under the industrial or conservation land use scenarios. These infiltration rates are not well justified or appropriately conservative to establish PRG values. The DOE should develop PRG values that are protective of groundwater and surface water for infiltration rates such as those identified under the irrigation scenario or volcanic damming of the Columbia River, which may dramatically increase saturation and transport conditions in the current vadose zone.

- No preliminary remediation goals to protect groundwater and surface water have been set for uranium in the vadose zone. The Proposed Plan states “[Preliminary Remediation Goals] provide the basis for cleanup levels in the ROD.” No PRG values have been provided for uranium in the vadose zone under any exposure scenario. Because PRG values are used to measure and evaluate compliance of remedial actions, the absence of PRG values for uranium in the vadose zone means there is no performance standard for the selected remedial alternative. Based on the text of the Proposed Plan, this omission indicates that the final Record of Decision (ROD) will not include cleanup levels for vadose zone uranium. Failure to include PRG values for known contaminants of concern makes the Proposed Plan in its existing form deficient and constitutes an unacceptable regulatory arrangement for remediating the 300 Area. The Proposed Plan should include PRG values for uranium isotopes and total uranium in the vadose zone.
- PRG calculations rely on environmental stasis. Page 5-88 indicates that the high partitioning coefficient of uranium means that it will not move through the vadose zone quickly enough to contaminate groundwater; stated in the RI/FS “it takes longer for the vadose zone contamination to enter the groundwater than the groundwater to decline below the DWS.” This assumption does not allow for any significant environmental change which may introduce larger volumes of water to parts of the vadose zone (e.g., irrigation or mining). Such changes may result in severely compromising future performance of remedial alternatives that leave the uranium source term in the subsurface. Reasonable assumptions regarding changes in land use at the 300 Area or the possibility of significant changes should be incorporated in the infiltration rate or groundwater elevation as part of the evaluation of remedial alternatives.

7. Human Health Soil Risks: Tribal Risks: Again identified as higher than the risk for the residential scenario.

Accumulated scientific evidence demonstrates that Native Americans are, as a statistical cohort, subject to the highest risk of disease and cancer from exposure to environmental contaminants. The Columbia River Basin Fish Contaminant Survey is a technical report that assesses the amount of chemical pollution in certain species of fish, and the potential health risks from eating fish those fish. The study is based on fish samples collected between 1996 and 1998 from tribal fishing waters in Washington, Oregon and Idaho. EPA funded the study which was coordinated by the four member tribes of the Columbia River Intertribal Fish Commission (CRITFC).

The YN ERWM Program request official DOE recognition that Native Americans living near the Hanford site are the most vulnerable people to environmental contaminants due to higher exposure levels, as underscored by EPA’s Columbia River Fish Contaminant Survey. Adults in CRITFC’s member tribes who eat fish frequently (48 meals per month) over a period of 70 years may have cancer risks that are up to 50 times higher than those in the general public who consume fish about once a month.

The Preferred Alternative (3a) lacks discussion of how it results in *minimal (if any) impacts to environmental justice*. The philosophy underlying the cleanup of Hanford should be guided explicitly by the goal of allowing Native Peoples to safely live the lifestyle to which they are entitled and prevent YN from suffering disproportionate impacts. This way of thinking will be particularly important when considering how to incorporate non-

quantitative elements into the Preferred Alternative such as the spiritual or cultural value of a site.

- The total ELCR estimates from use of Groundwater as a Potential Drinking Water source is 5.2×10^{-4} for nonradiological COPCs and 4.9×10^{-4} for radiological COPCs (total cumulative ELCR is 1.0×10^{-3}), which are greater than the EPA upper target risk threshold of 1×10^{-4} . The HI is 6.9, which is greater than the EPA target HI of 1.0. The Total Cumulative ELCR for radionuclide analytes is 1.0×10^{-3} . The total ELCR estimates from groundwater as a source of steam in a sweat lodge is 1.6×10^{-3} for nonradiological COPCs and 2.4×10^{-2} for radiological COPCs, which are both greater than the EPA upper target risk threshold of 1×10^{-4} . The HI is 119, which is greater than the EPA target HI of 1.0 (excerpts from G1.2.1.1 300 Area Subregion).
- There remains unacceptable risk disproportionate impacts to the YN tribal members from both chemical and radiological contaminants. Much of the risk assessments are based on the RCBRA and other supporting documents (unapproved or has unresolved comments by the Tri-Party Agencies).

The YN has outstanding issues with the use of River Corridor Baseline Risk Assessment and its 'sub-documents' [i.e. Tier 1 document for wildlife or the Tier 2 document for plants and invertebrates] as a major supporting document in cleanup decisions for the River Corridor Areas. These documents are not finalized or approved nor have our comments and concerns been addressed.⁸

- RCBRA (River Corridor Baseline Risk Assessment Volume II, Part 1: Human Health Risk Assessment August 2011): Volume II, Part 1: Human Health Risk Assessment August 2011 pg 7-34: For the Nonresident Tribal scenarios, the total cancer risk estimates exceed 10^{-4} and HIs exceed 1.0 for all ROD areas.
- Risks to the YN Tribal members should be calculated and included in the Alternative selection decision-making process using the YN risk scenario post ~22-28 years of remedy selection.⁹ As evaluated and explained in the RCBRA, by the year 2075, subsistence farmer RME cancer risks above 1×10^{-4} are related overwhelmingly to arsenic exposure from produce ingestion. Because the CTUIR resident and Yakama resident scenarios use very high (subsistence level) site-raised food ingestion rates, strontium-90 still plays a significant role in food-related exposures at year 2075 for these scenarios. (pg 6-22, DOE/RL-2010, Rev 0).
- Statement is made that radionuclides associated with historical waste disposal continue to contribute the majority of risk and will take more than 28 years (see page 29/PP) to reach concentrations less than the residential PRGs. This seems to be a conflicting statement. Clarify if dissolved uranium something separate. Clarify the time for all radionuclides (identify each separately) to decay to below residential PRGs.

⁸ See our February 28, 2011 letter to the Tri-Party Agencies (DOE-Matt McCormick, EPA-Dennis Faulk, and Ecology- Jane Hedges)

⁹ See our review comments on the Proposed Plan for Remediation of the 100-FR-1, 100-FR-1, 100-IU-2, 100-FR-3, and 100-IU-6 DOE/RL-2012-41 Draft A and the Remedial Investigation/Feasibility Study for the 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2 and 100-IU-6 Operable Units, DOE/RL-2010-98, DRAFT A December 2012.

- Conservation/mining land use is as a part of the basis for the preliminary remediation goals (PRGs). YN disagrees with this land use designation to develop PRGs. Our Treaty rights guarantee (among other rights) use of groundwater for sweat lodge activities. Groundwater is to be restored to its most beneficial use, which is drinking water standards (i.e. Method B, unrestricted land-use values). All PRGs should be calculated based on unrestricted land-use (at the very minimum.) See our previous comments on modeling and PRGs.
- Many PRGs have been inappropriately developed and uncertainties remain as these documents still require revision. Our concerns remain regarding the methodology used to calculate the EPCs. EPA's ProUCL methods were identified yet in some instances a 95UCL was not calculated (a maximum value used instead). Use of the max ignores most of the information in the data set.
 - When the number of measurements is small (e.g., $n < 5$) or the detection frequency is low ($< 5\%$), ProUCL ultimately recommends collection of more samples to compute defensible statistics.¹⁰ Collection of additional samples was not done. Some unremediated waste sites may have exceedances of PRGs, which would provide the basis for remedial action or further evaluation. EPA review of YN comments on these issues in our earlier correspondence on the RCBRA, etc would provide further clarification.
- A review of CVP documents (most dating 2001-2008) for a number of waste sites raised concerns. Several indicate the use of outdated standards or as of yet agreed to (by the Tri-Parties) values (i.e. the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a) to calculate non-radiological COCs, [e.g. copper, lead, selenium, TPH; Aroclor-1254]. Many state use of MTCA 1996 values or soil RAGs based on "100 time groundwater cleanup rules and 100 times dilution attenuation factor times surface water quality criteria. Provide a more detailed explanation of the review of all CVPs including the comparison process and whether additional characterization and/or sampling was performed for those CVPs where filtered sampling results, etc where utilized. Adjust the need for addition site-specific remediation as warranted.
- Text (and Table A-1) within the document identifying 20mg/kg for arsenic as an unrestricted land use clean up value is misleading. It implies Washington State

¹⁰ quotes from EPA sources, supporting use of the 95% UCL:1) Dec 2002 OSWER 9285.6-10 (<http://www.hanford.gov/dqo/training/ucl.pdf>) "It is important to note that defaulting to the maximum observed concentration may not be protective when sample sizes are small, because the observed maximum may be smaller than the population mean..... The use of the maximum as the default EPC is reasonable only when data samples have been collected at random from the exposure unit and sample size is large" (p. 20). 2) ProUCL Ver. 3.0 (Singh et al, 2004) (<http://www.epa.gov/nerlesd1/tsc/images/proucl3apr04.pdf>)

"It is recommended that the maximum observed value NOT be used as an estimate of EPC....It should be noted that for highly skewed data sets, the sample mean indeed can even exceed the upper percentiles (e.g., 90%, 95%), and consequently, a 95% UCL of the mean can exceed the maximum. This is especially true when dealing with log normally distributed data sets of small sizes" (p. 55).

Department of Ecology concurrence with use of this value on the Hanford site as background. The 20mg/kg cleanup level is the WAC 173-340 (1996) Method A value.

- The YN ERWM Program believes it is incorrect to apply Method A on the complex Hanford site as it is used for sites which contain a small number of hazardous substances.

Its application has resulted in residual levels for arsenic which do not reflect the Unrestricted Land Use Soil Cleanup Standards WAC 173-340-740(3)) 2007 Method B value (0.67 mg/kg) and the MTCA ("Deriving Soil Concentrations for Groundwater Protection" [WAC 173-340-747(3)(a)]), groundwater protection value (0.00737 mg/kg) cleanup values (which would default to site background levels of 6.5mg/kg). The proposed 20 mg/kg value for arsenic exceeds the 1×10^{-6} individual cancer risk based on the MTCA.

- In simple terms, the risk analysis showed that casual users of the River Corridor as it is have low enough risk to be safe. However, all of the residential user scenarios have unacceptably high risk. Some of the risk was associated with uranium, mercury, chromium, cadmium, and radiological contaminants. But a major part of the high risk levels found in the residential scenarios is from consumption of arsenic contaminated plants, animals and water. A large proportion of Nonresident Tribal cancer risk and HI is related to arsenic soil concentrations that are approximately equivalent to levels in areas unaffected by Hanford Site activities. When cancer risk estimates are calculated without the contribution of arsenic, the total cancer risk estimates still exceed 10^{-4} for all six ROD areas.
- While much of the arsenic is assumed to be from pre-Hanford agricultural practices, there was a portion that could be attributed to Hanford operations. That amount of the Hanford process arsenic load should be determined, and the cleanup of that arsenic should be a part of the Hanford cleanup plan.
- The Proposed Soil cleanup levels for Hexavalent Chromium to ensure protection of groundwater should be set at 0.2 mg/kg. This value is found using a Kd value of 0 mL/g and more accurately depicts movement of this contaminant through soils. Fate and transport simulations presented in DOE/RL-2010-98 should be recalculated using 0.0 Kd value. All concentrations in the groundwater and along the shoreline and the subsequent timeline for decline in concentration should be re-evaluated using a 0.0 Kd.

8. Costs: Clarification and inclusion of information is needed in the Proposed Plan and analysis of the appropriate alternatives in several areas:

- Clearly the Proposed Plan and decision documents do not adequately explain how cleanup meets the National Historic Preservation Act consultation process, including, for example, the specific and concrete steps for how cleanup in the cultural areas will proceed in a manner that prevents damage/disturbance (e.g., specific soil sampling designs to protect artifacts), including associated costs or served to resolve the concerns presented to the National Remedy Review Board (NRRB MEMO, June 26, 2012) regarding cultural resources and other areas of concern for the Yakama Nation.

Cost analysis for required well-conceived plans for performance monitoring that identify and correct potential failures and plans for maintenance and repair, including possible total system replacement is missing (NRC, 2000). This level of planning, both technical

and financial (i.e., costs, does not appear to have been included in the Proposed Plan or the analysis of alternatives).

- It appears that incremental costs have escalated (~doubled) for basically same remedies as proposed in the previous 300 Area Proposed Plan without explanation.

The Preferred Alternative (or Proposed Plan) does not include the required description of the contingency measures that will be implemented should the monitoring show that natural attenuation is unable to achieve the cleanup goals. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-98-031). Update and provide details in the Proposed Plan for public review including cost of implantation of contingency measures.

- Clarify if remediation costs for waste sites whose remediation expected to begin under the Interim ROD for the 300-FF-2 are fixed and will not increase. Clarify what would be an estimate of increase in costs should these identified sites not have remediation under the Interim ROD. (e.g., The Proposed Plan does not clearly explain how the 300-FF-2 OU will incorporate remediation of the 324 Building nor does the Preferred Alternative consider remediation its contaminants of concern or the associated costs). Although there will be an amendment to the 300-FF-2 OU Interim ROD, all changes will be incorporated in one final ROD for the 300 Areas. Clarification is need for better public understanding of the whole process.
- Clarify what is the cost estimate for currently inaccessible pipelines which are to be RTD (a comment element to all Alternatives). Removal/disposition of currently inaccessible pipelines (due to their close proximity to long-term facilities) is not included in the RDT discussion.
- Discussions of significant funding and building of ERDF infrastructure is an associated element of the 300 Area RI/FS/PP process, however DOE has not provided related cost estimates or how ERDF costs are managed or related uncertainties. Clarification of how operation and maintenance costs are allocated is needed. Without this discussion, the public maybe mislead.
- Clarify what is the cost for treatment/remediation of identified long-lived TRU radionuclides of plutonium and americium and cesium-137 and strontium-90 (the 618-10/618-11 burial grounds).
- With separate ROD decisions in place, it is difficult to understand costs related specifically to the Preferred Alternative actions. Use of figures only in the Proposed Plan doesn't provide enough clarity. Suggest use of separate Tables in addition to figures.
- Design elements for Alternatives selection should be described in sufficient detail in the Proposed Plan so that the public can evaluate and comment on the proposal (EPA 540-R-98-031). The Proposed Plan provides the foundation for the ROD to defer the final technology selection to the remedial design phase. Any associated costs should be included in the Proposed Plan.

- It is unclear if any of the Alternatives were evaluated against the nine balancing criteria based on what happens with transition to Long-term Stewardship prior to completion of remediation under the Record of Decision (e.g., Clarify if a cost benefit analysis of remedy costs including long-term stewardship costs done. The environmental consequences of doing this action or not doing it have not been evaluated. It is unclear how any of the Alternatives can ensure compliance with the balancing criteria with transition into Long-term Stewardship. These analyses should be done as this action will clearly need to be reflected and integrated into the final ROD.

9. General Comments on NEPA: The relationship of NEPA and NEPA values to related information is not clearly presented.

- Rewrite for clarity and include discussion that some of the required assessments supporting NEPA values that are not yet made until after the RI/FS is approved. The statement, "NEPA values were incorporated into the assessment conducted as part of the FS" gives the impression that NEPA values were done in the FS, and that is the end of NEPA values. Many of NEPA values are incorporated and enforce implementation of applicable laws and regulations into later phases of the CERCLA documentation process, including the ROD and RD/RAWP. Correct text and provide reference in RI/FS.

10. General Comments on Future Interim ROD changes:

- Statements like "There will be a period of time between when the final action ROD is approved and the required RD/RAWP is prepared and issued. During this period, DOE-RL plans to continue remedial activities, such as waste site RTD. In order for these actions to be consistent with the final action remedy selection, the current interim action RD/RAWPs will be modified using the TPA (Ecology et al., 1989a) change notice process to include the final cleanup levels specified in the final action ROD when it is issued" do not comply with CERCLA regulations.

The CERCLA process for changes in cleanup values in a ROD requires, at a minimum, an Explanation of Significant Difference (ESD) and maybe a ROD amendment. The TPA cannot circumvent the required CERCLA process. The YNERWM program expects review opportunities.

11. General Comments on sections within the Proposed Plan:

1. Principal Threat Wastes & Current and Future Exposure Scenarios:

Identify reference to the health and safety program managing worker exposure concerns.

- Clarify the reason for the ratios used under the industrial worker scenario (6 hours indoors and 2 hours outdoors) and over a 25 year period rather than a 30 year period.
- It is misleading to the public to state only three sites in the 300-FF-2 OU contain principal threat waste; it seems if only three sites were ever contaminated. Clarification is requested.
- Clarify if the 618-2 Burial ground was a disposal site similar to the 618-10 & 11.
- It is unclear in the discussion of the Alternatives 2, 3, 3a, 4, and 5 how treatment for long-lived the identified TRU radionuclides of plutonium and americium and

cesium-137 and strontium-90 is included. Clarify in this section and also in the Alternatives discussions.

2. Principal Threat Waste Approach: Delete text referencing 1×10^{-3} . This is very misleading to the public. EPA guidance states point of departure is 1×10^{-6} .
3. Scope and Role:
 - See previous comments on exclusion of contaminants emanating from the 200 Areas/200-PO-1 OU. Proposed Plan does not clearly explain how the 300-FF-2 OU will incorporate remediation of the 324 Building nor does the Preferred Alternative consider remediation its contaminants of concern. Piece-mealing of sub-areas makes for inconsistent cleanups and ignoring the remediation of groundwater contaminants.
 - Table 1 list the Principal Risk Driver COCs for the Vadose Zone for the 300-FF-1 & 2 OU yet Uranium is seemingly the only COC that will be addressed by the Preferred Alternative.
 - Clarify how these principal risk drivers to the groundwater are being remediated and demonstrate (using travel times, etc) that contamination from these COCs will be prevented downstream and/or from reaching the river in exceedence of the DWS, MCLs, AWQS.
 - Table 1 lists the Principal risk driver COCs but excludes the following COCs which are included in Table A-1: Include these as contaminants to be remediated and monitored or provide a discussion of the relationship of Table 1 to Table A-1 for reader clarification: Copper, zinc, vanadium, silver, pyrene, lead, arsenic, antimony, boron, molybdenum, mercury, hexavalent chromium, and selenium.
4. General Comment on the Remedial Action Objectives:
 - The purpose of Remedial Action Objectives (RAOs) is to explain and address site risks and to include an action (and specifics/details) to be taken achieve the objective. RAOs are the measurement tools for evaluating the success of the ROD remedy during the CERCLA 5 year review process. Without a specific action, the metrics for measurement are filled with subjectivity and uncertainty.
 - None of the seven (7) RAOs have a definitive task or standard to be met. An Example of a specific action to include using RAO#2: Prevent COCs migrating and/or leaching to surface water *by treatment of the contaminated soils or RTD.*

Clarify all RAOs with specific action(s) to be performed and/or standard(s) to be met.

5. General Comment on Removal, Treatment, and Disposal at Waste Sites:
 - Clarify in this section's discussion that currently inaccessible pipelines are to be RTD as this is a comment element to all Alternatives. Include any RCRA pipelines if relevant. Clarify if there are pipelines at deeper depths which will not be removed.
 - Clarify how the determination was made that the 324 Building Cells C & D have the capacity and the structural integrity to howl the highly contaminated soils of the 324 building.

- Provide reference to the CERCLA Action Memorandum #2 under which removal of the 324 Building will be performed; it is currently unavailable for public review.
 - Clarify how the highly contaminated soil will be immobilized prior to placement in Cells C & D of the 324 Building.
- General: Reader has difficulty understanding where there are 37 or more waste sites yet to be remediated under the existing Interim ROD for the 300-FF-2 OU. Clarify and identify these waste sites in the Proposed Plan. Clarify the “re-evaluation process” for the 90 sites previously remediated under the Interim ROD in the Proposed Plan.
- 6. General Comments on Temporary Surface Barriers and Pipeline Void Filling:
 - Design of surface barriers and discussion of pipeline void fillings should be included in the ROD per EPA guidance and the RCRA permit not within the RDR/RAWP. Correct this statement in the Proposed Plan.
 - Removal/disposition of currently inaccessible pipelines (due to their close proximity to long-term facilities) is not included in the RDT discussion. More clarification is needed. Clarify what is the cost estimate for their removal. Include this in the Proposed Plan and the Alternatives evaluation and analysis.
 - Clarify if the 300 Retired Radioactive Liquid Waste Sewer will be remediated in the 300-FF-2 OU remediation. Clarification and costs analysis is needed. Include this information in the Proposed Plan and the Alternatives evaluation and analysis.
 - Clarify if there are pipelines at deeper depths which will not be removed. Include this information in the Proposed Plan.

12. Human Health Risk Assessment Additional Comments:

- The human health risk assessment for the RI/FS and Proposed Plan is based primarily on results of the River Corridor Baseline Risk Assessment (RCBRA), on which the Yakama Nation has provided substantial comments previously, supplemented with a limited risk evaluation for the 300 Area. The Proposed Plan (p. 6-5) and RI/FS (p. 6-5) state that the RCBRA and RI/FS found few waste sites exceeding EPA target risk and hazard limits for a residential exposure scenario and no waste sites exceeding these limits for the industrial/commercial scenario. The approach and assumptions made in the risk assessments, however, do not adequately assess the cumulative risks that a Yakama member would encounter on the Hanford Site. The 300 Area RI/FS did not apply the Yakama Nation Exposure Scenario to estimate cumulative risks for all media combined or to develop cleanup levels protective of tribal members who will use the river, nearshore, and upland areas of the site. Key issues with the RCBRA that were never addressed and continue to limit its application to the 300 Area include:
 - The RCBRA was not a cumulative baseline risk assessment, as it excluded certain contaminants, waste sites, non-operational areas, and the Columbia River itself from the assessment. Similar to the RCBRA, the RI/FS failed to consider all sources of contamination, describe transport mechanisms through all environmental media, and evaluate cumulative risk to tribal members based on a traditional subsistence

lifestyle. For example, insufficient data were used to characterize exposure from groundwater and fish ingestion, which are both very important exposure pathways.

- The RCBRA was not a “baseline” risk assessment and was biased in that it assumed institutional controls to limit exposures. CERCLA guidance directs that institutional controls *may not* be factored into a baseline risk assessment, and this directive is acknowledged by DOE’s guidance. Assuming that long-lived radioactive and hazardous contaminants remain in place also implies that long-term stewardship must be implemented that will remain effective longer than any human institution has ever existed.
- The RCBRA did not consider contaminants migrating from the Central Plateau. Contaminated groundwater from the Central Plateau has already reached the Columbia River and will continue to affect the 300 Area and River Corridor far into the future. Risks were assessed under the unlikely assumption of institutional controls and/or remediation of the Central Plateau, including the vadose zone and groundwater.
- The RCBRA compared site data to background or reference contaminant concentrations found in samples collected from sites inappropriately located onsite or proximal to Hanford; these locations have most likely been influenced by releases from Hanford in the form of airborne contamination and/or movement through the environment and food web. Additionally, risk management decisions were prematurely made during the baseline risk assessment process by excluding certain “background” concentrations from the estimates, when in actuality; these stressors contribute to baseline risks regardless of their source.
- The RCBRA only provided screening-level risk assessments for groundwater and fish ingestion. While additional risk calculations for exposure to groundwater were conducted for the 300 Area RI/FS, including risks to Native Americans, no additional risk calculations were made for the riparian, nearshore, or river areas of the 300 Area. The RCBRA did not consider a Tribal resident who also uses the river for fish and other subsistence uses. This is particularly important since the Columbia River Component (CRC) risk assessment found fish ingestion to be the largest contribution to Tribal human health risks from the river, exceeding EPA target risk limits.
- The Yakama Nation does not support an industrial use scenario for the anticipated land use for the 300 Area. This scenario allows for a less stringent cleanup based on the expectation of restricted use and institutional controls remaining in place for very long time periods. The Yakama Nation supports unrestricted use of the Hanford Site, including the 300 Area, and the site should be cleaned up to protect for unrestricted Tribal uses.
- The CERCLA limit for managing hazardous waste cleanup is referred to in the NCP and EPA’s directive 9355.0-30 as a target risk range of 10^{-4} to 10^{-6} and it is important to consider this *range* when arriving at “acceptable” risk limits for all peoples who may reside on or live near the Hanford site. The upper-bound (least protective) risk level of 1×10^{-4} may not be adequate as a “threshold” for calculating risk-based screening levels, as used in the Proposed Plan, particularly considering the degree of site-specific uncertainties and the multitude of contaminants found in the 300 Area.

- Methods used to develop radionuclide preliminary remedial goals (PRGs) in the RCBRA and 300 Area RI/FS only assumed a target cancer risk level of 1×10^{-4} . Using this risk level for a *baseline* risk assessment is inconsistent with EPA Risk Assessment Guidance for Superfund Part B, Chapter 4, titled "Risk-Based PRGs for Radioactive Contaminants," which states to "calculate risk-based PRGs for each carcinogen corresponding to a pre-specified target cancer risk level of 10^{-6} ." It is misleading to present the risk assessment results as being "similar between the RCBRA and the RI/FS for the residential scenario" when the RCBRA did not use the most appropriate and protective threshold target risk level.
- Additionally, interim cleanup actions were based on the radiation dose limit of 15 mrem/year, which equates to a lifetime cancer risk that is 3 times above the maximum allowable value (1×10^{-4}) under the federal Superfund program (and even more when other EPA risk coefficients are considered in the conversion).
- The 300 Area RI/FS assessment of groundwater risk, which was intended to provide the *baseline* risk assessment that was lacking in the RCBRA, found that risks to Native Americans using groundwater were 4- to 5-times greater than the EPA tap water scenario for drinking water ingestion presented in the RI/FS and were above risk and hazard target levels (p. 6-223). Exposure assumptions associated with the Native American scenarios should be used to develop cleanup levels for the 300 Area protective of such uses.
- The 300 Area RI/FS did not include cumulative risks summed across soil and groundwater because, according to DOE, the RME for a resident scenario does not include combined exposure to both media (p. 231). This segregation does not show the total risks to an individual, particularly a Tribal member living in the 300 Area who may be using groundwater and is exposed to soil as well.

13. Ecological Risk Assessment Comments:

- Ecological risks were calculated by individual waste site as though they were isolated from any other site when considering exposure to biological organisms. The cumulative potential exposure from all waste sites within a species-specific use area needs to be considered, particularly for species with a large home range that may be exposed to multiple waste sites.
- Biological populations were defined too broadly. While it is reasonable to consider area-use-factors in estimating risks, populations were defined such that even individuals visiting a waste site with elevated risk would not result in a substantial impact on the overall population of that species (effectively diluting the risk across a large population).

14. Data Used in Risk Assessments.

- The human health and ecological risk assessments in the RI/FS form the basis for development of the risk-reduction cleanup levels. However, these risk assessments are based primarily on the River Corridor Baseline Risk Assessment (RCBRA) and the Columbia River Component (CRC) risk assessment. The YN has commented on these previously, but the issues raised have yet to be addressed. These include:
- Inadequate numbers and locations of chemical and biological samples were used to characterize the site.

- Inappropriate reference and background data were used to evaluate site data.
- Numerous issues exist with data quality.
- Contaminants migrating from other portions of the Hanford site or from offsite were excluded.

15. Fate and Transport Modeling, PRG Development Additional Comments:

- Many simplifying assumptions have been incorporated into the uranium transport modeling that makes the results highly uncertain. Uranium transport modeling in the 300 Area has been performed to support remedial alternative evaluation as part of the RI/FS Report and Proposed Plan. There are several overly simplifying assumptions that are incorporated into the transport model. Some of these assumptions include:
 - Significant simplification of local geology.
 - Assumed hydrologic boundary conditions in the past and future (10-, 50-, and 100- year events have been eliminated, resulting in a restricted set of river stages applied repeatedly).
 - Simplified calculation of partition coefficients that may not reflect actual uranium behavior.
 - Simplified hydrologic regimes in the Columbia River and restricted flow paths for hyporheic water and groundwater.
 - Simplified initial distributions of uranium, which included assigning values derived from cleanup verification package data to one of two depths, and extrapolating between data points.
 - Assumed sorption/desorption behavior of uranium under dynamic flow conditions.
- While model runs can be compared against observed values for a portion of the domain, ultimately the results must be viewed as only one possible outcome that may occur in the future depending on environmental variables and remedial actions. The DOE should incorporate the uncertainty and consider the associated reductions in alternative performance that may result from changes in environmental variables into the evaluation of CERCLA balancing criteria. Where sensitivity analysis has not been performed, performance uncertainty should count against the long term effectiveness of remedial alternatives that leave uranium in the vadose and periodically rewetted zones.
- Uranium transport modeling boundary conditions are not realistic for the remedial alternative performance time period. Hydrologic boundary conditions for the uranium transport model specified in Appendix F were constructed using data from relatively short periods of time (e.g., 1 year for the river side lateral boundary) that are then repeated over the performance period of the model (3,000 years). This approach does not capture the impact of 10-, 50-, 100-, or 1,000-year events which include unusually high discharges, heavy rainfall, and other infrequent events. Such events are likely to inundate higher portions of the vadose zone than flows during a typical year. The hydrologic boundary conditions should include a greater range of groundwater and river stages that ensure unusual and infrequent events are considered as part of remedial alternative performance evaluations.
- Uranium transport modeling transects do not characterize areas of highest contamination. Modeling of uranium transport in the subsurface as part of PRG development should be performed at locations where maximum contamination is expected to occur. The current 2-dimensional transect alignments are located

orthogonal to inferred flow paths down gradient from waste sites known to have residual contamination that is more than 10 times the identified background concentration. Dilution of labile constituents is known to occur with transport, making the transect positioning used sub-optimal for determining the concentrations of uranium in groundwater following remedial actions. Additional transect results should be added to the RI/FS Report that include areas of greatest soil contamination for each of the proposed remedial alternatives to provide appropriate evaluation of their performance.

- Uranium transport modeling assumptions are biased to favor polyphosphate treatment. Modeled attenuation of the groundwater plume evaluates the preferred alternative's performance by removing portions of the uranium source from the vadose and periodically rewetted zones; this would not occur as part of the polyphosphate treatment. Additionally PNNL (2009) has indicated that sequestered uranium may easily be remobilized. Removing portions of the source term would be appropriate for Alternatives 4 or 5, but should not be used for Alternatives 3 or 3a. Using this approach to evaluate the efficacy of the polyphosphate treatments is not appropriate or realistic in light of the previous field tests and published results. Using such an assumption constitutes a deficient analysis that is biased and creates the impression that the Preferred Alternative will perform better than is realistically expected, requiring lower capital expenditures and fewer environmental impacts. The uranium transport modeling should evaluate remedial alternative performance that realistically leaves the source term uranium in place as is contemplated by DOE for polyphosphate treatment, and removes uranium for RTD alternatives. Polyphosphate modeling should incorporate the observed remobilization of uranium following the treatments as was described in PNNL-18529 and the findings of these analyses should be incorporated into the evaluation.
- Infiltration scenarios used in PRG development are not appropriate. Infiltration scenarios used for the post closure period are not well justified, and do not represent a realistic set of site conditions under which the selected remedial alternative will perform. PRG infiltration scenarios are based on very low rates of infiltration identified under the industrial or conservation land use scenarios. These infiltration rates are not well justified or appropriately conservative to establish PRG values. The DOE should develop PRG values that are protective of groundwater and surface water for infiltration rates such as those identified under the irrigation scenario or volcanic damming of the Columbia River, which may dramatically increase saturation and transport conditions in the current vadose zone.
- No preliminary remediation goals to protect groundwater and surface water have been set for uranium in the vadose zone. The Proposed Plan states "[Preliminary Remediation Goals] provide the basis for cleanup levels in the ROD." No PRG values have been provided for uranium in the vadose zone under any exposure scenario. Because PRG values are used to measure and evaluate compliance of remedial actions, the absence of PRG values for uranium in the vadose zone means there is no performance standard for the selected remedial alternative. Based on the text of the Proposed Plan, this omission indicates that the final Record of Decision (ROD) will not include cleanup levels for vadose zone uranium. Failure to include PRG values for known contaminants of concern makes the Proposed Plan in its existing form deficient and constitutes an unacceptable regulatory arrangement for

remediating the 300 Area. The Proposed Plan should include PRG values for uranium isotopes and total uranium in the vadose zone.

- PRG calculations rely on environmental stasis. Page 5-88 indicates that the high partitioning coefficient of uranium means that it will not move through the vadose zone quickly enough to contaminate groundwater; stated in the RI/FS "it takes longer for the vadose zone contamination to enter the groundwater than the groundwater to decline below the DWS." This assumption does not allow for any significant environmental change which may introduce larger volumes of water to parts of the vadose zone (e.g., irrigation or mining). Such changes may result in severely compromising future performance of remedial alternatives that leave the uranium source term in the subsurface. Reasonable assumptions regarding changes in land use at the 300 Area or the possibility of significant changes should be incorporated in the infiltration rate or groundwater elevation as part of the evaluation of remedial alternatives.

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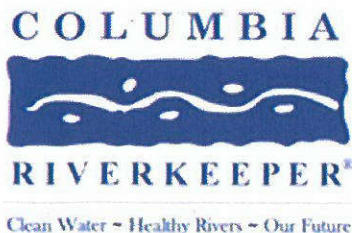
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RE: Public Comments on Proposed Plan for Remediation of the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (DOE/RL-2011-47, Rev. 0)

Dear U.S. Department of Energy:

Columbia Riverkeeper (Riverkeeper) submits the following comments on the U.S. Department of Energy's (Energy) Proposed Plan for Remediation of the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (DOE/RL-2011-47, Rev. 0) (hereafter "Proposed Plan"). Riverkeeper has grave concerns about Energy's plan to deal with radioactive and toxic pollution in the 300 Area. The Yakama Nation captures these concerns aptly, stating: "DOE is short-cutting the CERCLA cleanup process at Hanford in order to meet TPA milestones and save money." Energy's Proposed Plan: (1) fails to deal with radiological and chemical contaminants and long term risks to the Columbia River, and (2) leaves much of the toxic waste sites, without addressing impacts to the environment and human health. Overall, the Proposed Plan relies on an unproven technology to deal with uranium pollution and fails to provide a well-reasoned and

supported explanation of why Energy cannot remove more uranium and other pollution. Riverkeeper urges Energy to revise the Proposed Plan to address these serious shortfalls. Riverkeeper also requests that the U.S. Environmental Protection Agency (EPA) ensure Energy's Proposed Plan for the 300 Area complies with federal law and protects current and future generations that use the Columbia River and Hanford Site.

RIVERKEEPER'S COMMITMENT TO HANFORD CLEANUP

Riverkeeper is a 501(c)(3) nonprofit organization with a mission to protect and restore the Columbia River, from its headwaters to the Pacific Ocean. Since 1989, Riverkeeper has played an active role in monitoring and improving cleanup activities at the Hanford Nuclear Reservation (Hanford). A legacy of the Cold War, the Hanford continues to leach radioactive pollution into the Columbia River. Hanford's legacy is not a local issue. Nuclear contamination from Hanford threatens the Pacific Northwest's people, a world renowned salmon fishery, and countless other cultural and natural resources.

Riverkeeper's staff and members are dedicated to a long-term solution for Hanford cleanup. Hanford is one of the world's most contaminated sites. Despite this status, the public and Riverkeeper members continue to catch and consume fish from the Columbia River, drink water from the Columbia, and recreate near and downstream of Hanford. The federal government has a duty to ensure that Hanford's nuclear legacy does not compromise current and future generations use and enjoyment of the Columbia River.

COMMENTS ON PUBLIC PARTICIPATION

Riverkeeper encourages Energy to strive for robust public participation in future River Corridor Cleanup decisions. Riverkeeper suggests the following improvements to encourage greater public participation:

- Provide a longer public comment period. For significant cleanup plans, Energy should provide a minimum 90-day public comment period. Commenting on cleanup plans demands reviewing thousands of pages of detailed technical information; substantive public input requires more than 30 days.
- Provide more lead time before scheduling public hearings. Energy scheduled public hearings in Seattle, Richland, and Hood River with little prior notice to interested stakeholders. For future hearings, we urge Energy to provide more advanced notice before scheduling hearings.
- Improve the readability of the Proposed Plan and related documents. The Proposed Plan is thick with acronyms, many of which are not identified in the text of the document, instead relying on a Glossary of Terms. Additionally, the document should incorporate more clearly information from the underlying Remedial Investigation/Feasibility Study (RI/FS) and River Corridor Baseline

Risk Assessment (RCBRA), providing more specific citations and conclusions from those documents in the text of the Proposed Plan.

COMMENTS ON 300 AREA PROPOSED PLAN

Riverkeeper urges Energy to revise the Proposed Plan to ensure long term protection of public health and the Columbia River. From the 1940s until the late 1980s, the federal government used the 300 Area for nuclear fuel fabrication and research and development activities. This included discharging uranium, copper, and other heavy metals to ponds near the Columbia River shoreline. Large plumes of contaminated groundwater underlie much of the 300 Area, and contaminated soil exists in many areas. Energy's own studies demonstrate that pollution from the 300 Area is already contaminating aquatic life in the Columbia River. *See GW Patton et al., Survey of radiological and chemical contaminants in the near-shore environment at the Hanford Site 300 Area* (March 2003) (PNNL-13692, Rev. 1) (Exhibit 1). Despite this fact, Energy relies on an unproven technology to address uranium pollution, provides unsubstantiated reasons for dismissing a more rigorous approach to removing contaminated soil, and uses an under protective cleanup standard that is contrary to law. Overall, the Proposed Plan for the 300 Area and the associated RI/FS Report do not support an adequate cleanup of the 300 Area.

In addition to the comments contained herein, Riverkeeper incorporates by this reference comments on the Proposed Plan submitted by the Yakama Nation. Letter from Yakama Nation to EPA and Energy (Sept. 10, 2013) (Exhibit 2).

A. Energy's Preferred Alternative Relies on Unproven Technology.

Energy's preferred alternative for the protection of groundwater relies on the application of polyphosphate solution to deeper zones of uranium contamination. Energy conducted experimental trials of polyphosphate injections in the 300 Area. The experiments proved problematic and ineffective. Energy nonetheless proposes that, in the event polyphosphate applications fail to reduce the mobility of uranium, no additional treatment will be applied.

In essence, Energy is setting up a scenario whereby it will use a technology fraught with technical uncertainty, and then default to "no cleanup" when the technology fails. Riverkeeper requests that Energy reconsider this decision. While Riverkeeper supports an active effort to limit uranium concentrations in groundwater, *see* Hanford Advisory Board Advice No. 257, polyphosphate injections are not an appropriate final remedy given the uncertainty surrounding the application of this experimental technology.

Energy's own studies cast significant doubt on the effectiveness of polyphosphate injections. In the Proposed Plan, Energy cites a phosphate injection pilot study, PNNL-18529, *300 Area Uranium Stabilization Through Polyphosphate Injection: Final Report*, in support of its preferred alternative. This report did not demonstrate the efficacy of

polyphosphate injections to stabilize uranium to the extent claimed by Energy. Contrary to Energy's claim of effectiveness, the report concluded that the "efficacy of uranium sequestration by apatite assumes that the adsorbed uranium would subsequently convert to autinite, or other stable uranium phases. **Because this appears to not be the case in the 300 Area aquifer, even in locations near the river, apatite may have limited efficacy for the retention and long-term immobilization of uranium at the 300 Area site.**"

PNNL-18529, *300 Area Uranium Stabilization Through Polyphosphate Injection: Final Report* (June 2009) (emphasis added). In the Proposed Plan, Energy even acknowledges the limitations of previous field tests, noting that "results of preliminary infiltration testing indicated that in certain areas of the 300 Area Industrial Complex, infiltration rates may be limited." Proposed Plan at 9. Energy assumes that infiltration rates will not present an obstacle to polyphosphate injections without specifically citing a successful test. *Id.*

Indeed, EPA referred to the polyphosphate sequestration approach as "innovative technology." In its response to concerns from the Hanford Advisory Board, EPA wrote,

Phosphate sequestration has been tested at Hanford and used elsewhere. It is still considered an innovative technology so considerable testing during deployment is appropriate. There is also remedial design work necessary to optimize the application the phosphate [sic]. For these reasons the proposed remedy includes a phase I which treats a small but significant part of the uranium and should provide information to optimize design for deployment at the rest of the uranium and treatment zone. EPA guidance for Proposed Plans and RODs explicitly identifies phased remedies for situations such as 300 Area uranium.

EPA, Response to HAB Advice #257, "300 RI/FS and Proposed Plan" (July 9, 2012) (Exhibit 3). EPA's candid acknowledgement of the need for additional field testing points to a fundamental flaw in Energy's plan: overreliance on an unproven technology. Energy proposed initially to use the polyphosphate injection in a concentrated area (approximately three acres), then expand its use to a larger area. In Alternative 3a, the preferred alternative, Energy now proposes to use the injection in the core three acre area without testing it for broader application. As a result, Energy fails to propose a plan to test or improve the application of polyphosphate sequestration in a "phased remedy" as outlined by EPA.

EPA's National Remedy Review Board, the Yakama Nation and the states of Oregon and Washington have expressed concerns about the lack of testing of the phosphate sequestration for over two years. The National Remedy Review Board's Recommendations for the 100-K, 200-UP-1, and 300 Area of the Hanford Superfund Site summarizes these concerns, stating:

Under the preferred alternative, the *in-situ* phosphate treatment would be implemented in a phased manner and its effectiveness would be evaluated during implementation. The Board notes that the effectiveness of this technology has not been demonstrated on a pilot or full scale at this or other sites Based on their comments, the states of Oregon and

Washington prefer the RTD [removal, treatment, and disposal] approach because of concerns about the effectiveness of the *in-situ* uranium sequestration process.

National Remedy Review Board, Recommendations for the 100-K, 200-UP-1, and 300 Area of the Hanford Superfund Site (June 26, 2012) (Exhibit 4); *see also* Letter from Yakama Nation to EPA (Aug. 3, 2012) (Exhibit 5) (stating “The [300 Area] preferred alternative relies on an unproven technology . . . which has not been demonstrated to be effective, has numerous technical problems, and has previously not worked in the 300 Area under similar circumstances.”).

Additionally, Riverkeeper urges Energy to examine more closely the durability of its proposed action. Application of the polyphosphate solution did not appear to preclude the remobilization uranium in previous field tests. In fact, uranium levels even increased two months after tests. *See* PNNL, *300 Area Uranium Stabilization Through Polyphosphate Injection: Final Report*, PNNL-18529 (2009) (Exhibit 6). As an additional problem, Energy’s modeling of uranium attenuation for the preferred alternative assumes that application of the polyphosphate solution will remove the source-term of uranium from the periodically rewetted zone. Energy’s modeled assumption rests on the efficacy and irreversibility of the proposed polyphosphate application. Before making this assumption, Energy should conduct more testing to resolve the uncertainty about the durability of the in-situ treatment.

Against this backdrop, Riverkeeper urges Energy to revise the Proposed Plan to include more extensive, detailed analysis of targeted and “extensive” excavation and disposal of contaminated soil. Energy should increase the specificity of its discussion of Alternative 4, and explain whether the Alternative incorporates, at the very least, a targeted excavation of the uranium source term in the core, 3 acre area where 80% of the uranium persists. Unlike in-situ sequestration, which may fail or become reversed by changing conditions, excavation permanently resolves contamination issues by removing sources of uranium.

B. Energy’s Cleanup Fails to Provide Reasoned Support for its Decision to Dismiss Extensive Excavation of Contaminated Soils.

Energy’s Proposed Plan fails to evaluate the feasibility of extensive excavation of highly contaminated soils by employing alternative dust suppression technologies. Instead, Energy’s takes the position that extensive soil excavation will result in increased uranium mobilization. Specifically, Energy reasons that water used for dust suppression would mobilize uranium. The Proposed Plan states: “Application of dust-control water during excavation of the vadose zone soils and partially saturated soils in the PRZ will release residual uranium contamination to the groundwater, as evidence by the uranium plume that was produced by the excavation of vadose zone soil at the 618-7 and 618-10 Burial Grounds.” Proposed Plan at 61. In general, the Proposed Plan lacks: (1) a comprehensive review of dust suppression options, and (2) a discussion and supporting data describing the history of successes and failures of dust suppression elsewhere at Hanford.

First, Energy's Plan fails to address and evaluate alternatives for dust suppression. For example, the mining industry regularly uses a variety of surfactants and other materials for dust control. Magnesium chloride, a chemical commonly used on highways and roads, is an example of the type of material that Energy's plan should analyze. Energy could also evaluate the potential to use a polyphosphate solution as a dust suppressant. If, as Energy contends in the Proposed Plan, a polyphosphate solution would be effective in durably immobilizing uranium, then the same solution may also be used to suppress dust. Using the polyphosphate solution as a mitigation measure for a more aggressive, deeper excavation may assist Energy in removing the source term of pollution while reducing the risk of mobilizing uranium.

Second, the Proposed Plan should describe other cleanup activities in the River Corridor where Energy employed a remove/treat/dispose (RTD) approach in the presence of highly mobile contaminants. For example, Energy elected to dig down 80 feet in the B/C area in Hanford's 100 Area to remove the source of the hexavalent chromium, a highly mobile contaminant. Energy is currently undertaking a similar "deep dig" approach in the 100 D area.

Interestingly, Energy's 2011 Site Groundwater monitoring report concluded that excavation activities may have resulted in the mobilization of chromium into groundwater in the B/C area, **but did not attribute increased chromium levels in wells directly to dust suppression activities.** See Energy, *Hanford Site Groundwater Monitoring Report, 2011*, DOE/RL-2011-118, Rev. 0 at 2.2-3 (Exhibit 7). In fact, the monitoring report indicated that dust suppression did not appear to influence monitoring wells. "Effects of recharge from the 182-B Reservoir (used to store river water for the Site-wide water supply), or dust-control water at the 100-C-7 waste site, are not evident in the existing monitoring network." *Id.* at 2.2-2.

Hoping to use "lessons learned" from the 100 B/C cleanup, and despite potential mobilization of chromium during cleanup, Energy is employing the same approach in the vicinity of the D and DR reactors. See Energy, "Hanford Deep Dig Removes Contaminated Soil" (March 11, 2013) (Exhibit 8). In the B/C and D areas, Energy has touted the success of deep excavations as a method of removing the source term of contamination, and has monitored the use of dust suppressant in the vicinity of highly mobile contaminants. Why was dust suppression used for digging up a highly mobile contaminant in one area of the River Corridor, but it's being treated as a non-starter in another?

In short, Energy's approach to dust suppression in the River Corridor seems disjointed, failing to connect the experience of one cleanup activity to another. The lack of a comprehensive analysis hampers the public's ability to understand Energy's conclusion that dust suppression is unworkable in the 300 Area because of its potential to mobilize uranium. For the purposes of the 300 Area cleanup, Energy must provide a more comprehensive explanation of how its cleanup decisions reflect the full scope of its experience using dust suppression in the River Corridor.

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C. Cleanup Should Protect Unrestricted Future Use of the 300 Area.

Energy's Proposed Plan fails to comply with applicable or relevant and appropriate requirements (ARARs) because it adopts an industrial use cleanup standard for the most contaminated portion of the 300 Area. *See* Proposed Plan at 28 ("Remediation of the 300 Area Industrial Complex and the 618-11 Burial Ground will be based on industrial scenarios, and the remainder of the 300 Area will be based on residential scenarios (Figure 13)."). The level of cleanup is dictated by a core assumption about how future generations will use this area of Hanford. The Proposed Plan assumes a portion of the 300 Area will only support industry and, therefore, proposes leaving radionuclide and toxic contamination. Energy's assumption is flawed. For the reasons explained below, Energy must ensure that cleanup protects future generations that may use the site for unrestricted uses, including drinking water, fishing, and outdoor recreation.

Hanford cleanup is subject to the Washington Model Toxics Control Act (MTCA) requirements as ARARs. The Proposed Plan fails to meet these standards. First, Energy based the decision to apply an industrial cleanup standard on the assumption that uranium was non-mobile – an assumption we now know is false. State law limits to use of an industrial cleanup standard to situations where the pollutants at issue are "relatively immobile" and not subject to "lateral migration" or are "otherwise contained." WAC 173-340-745(b)(iii)(B). The point is clear that the industrial standard would not be applied to a site like the 300 Area where the principle pollutant at issue, uranium, is not just mobile, but is actively causing contamination of ecological receptors such as Columbia River mussels, as a result of its mobility. *See* GW Patton *et al.*, *Survey of radiological and chemical contaminants in the near-shore environment at the Hanford Site 300 Area* (March 2003) (PNNL-13692, Rev. 1) (Exhibit 1).

Second, pursuant to WAC 173-340-745(1)(b)(iii)(B) the industrial standard can only be used where it would not "pose a threat to human health or the environment at the site or in adjacent non-industrial areas." In adopting the industrial standard, however, Energy assumes that uranium is not mobile. Energy's own studies show otherwise. WAC 173-340-745(1)(b)(iii) states:

The department expects that for portions of industrial properties in close proximity to (generally, within a few hundred feet) residential areas, schools or childcare facilities, residential soil cleanup levels will be used unless:

- (A) Access to the industrial property is very unlikely or, the hazardous substances are not treated or removed are contained under a cap of clean soil (or other materials) of substantial thickness so that it is very unlikely the hazardous substances would be disturbed by future site maintenance and construction activities (depths of even shallow footings, utilities and drainage structures in industrial areas are typically three to six feet); and
- (B) The hazardous substances are relatively immobile (or have other characteristics) or have been otherwise contained so that subsurface lateral migration or surficial transport via dust or runoff to these nearby areas or facilities is highly unlikely; and [sic]

The proposed industrial use area is in close proximity to areas zoned for residential use and, as described above, the hazardous substances are not "relatively immobile." Energy, therefore, cannot rely on an industrial use cleanup standard.

Third, MTCA requires that soil cleanup levels protect against contamination of groundwater beneath the soil cleanup site. WAC 173-340-700(6)(b); WAC 173-340-747(2)(a). State law is similarly clear that the industrial cleanup standard is not appropriate when soil cleanup levels should be based on the need to protect groundwater or surface water. WAC 173-340-745(1)(b)(iv). Given that uranium is leaching from the 300-FF-2 area into the groundwater and the groundwater is leaching uranium into the Columbia River, cleanup standards for the 300 Area must be based on what is necessary to protect existing and beneficial uses of both groundwater and surface water. As state law explains:

[F]or sites where the soil cleanup level is based primarily on the potential for the hazardous substance to leach and cause ground water contamination, it is the department's expectation that an industrial land use will not affect the soil cleanup level. Similarly, where the soil cleanup level is based primarily on surface water protection or other pathways other than direct human contact, land use is not expected to affect the soil cleanup level.

WAC 173-340-745(1)(b)(iv). Even if the future land use of a given site is industrial, the industrial cleanup standard cannot be applied to a location like the 300 Area where the soil cleanup level should be based on surface and ground water protection.

Furthermore, Energy cannot rely on the industrial use designations under the Hanford Comprehensive Land-Use Plan to justify future land use scenarios. Under MTCA, the use of an exposure scenario other than residential use requires a zoning designation under the state's Growth Management Act (GMA). WAC 173-340-745(1)(b)(ii)-(iii). MTCA does not carve out any exceptions for federal facilities that are not zoned under a GMA county comprehensive plan. The Hanford Site is not zoned industrial under the Benton County Comprehensive Plan. The 300 Area, therefore, does not meet the requirements of WAC 173-340-745(1)(b)(ii)-(iii) because: (1) the 300 Area is not zoned industrial under the Benton County Comprehensive Plan, and (2) Energy's land use plan, the Comprehensive Land-Use Plan EIS and Record of Decision, was not adopted under the Growth Management Act. Under the plain language of MTCA's implementing regulations, Energy cannot apply the industrial cleanup levels.

Finally, Riverkeeper objects to Energy's over-reliance on institutional controls. Because of the site's proximity to the City of Richland and the Columbia River, use of the 300 Area is likely to increase during the timeframe in which uranium will exceed residential standards in the 300 Area. As a result, Energy should proceed towards cleanup that achieves an unrestricted use standard.

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D. Energy's Reliance on Natural Attenuation, or "Do Nothing," as a Cleanup Strategy is Not Supported by the Evidence.

Energy proposes monitored natural attenuation for multiple contaminants of concern in the 300 Area. In addition, if the proposed "enhanced attenuation" of uranium does not successfully sequester uranium in soils, preventing it from reaching groundwater, Energy has not articulated a plan other than natural attenuation for the persistent, significant uranium plume in the 300 Area. Riverkeeper disagrees with the use of monitored natural attenuation for uranium and other contaminants that threaten the Columbia River.

Reliance on monitored natural attenuation to remediate groundwater in the 300 Area is the same remedial action selected in earlier interim Record of Decision (ROD) for the 300-FF-5 Operable Unit. Monitored natural attenuation failed to perform as intended. Energy's RI/FS for the 1996 ROD predicted that groundwater standards would be achieved no later than 2002. As the Yakama Nation explains in its 300 Area comments: "It is apparent that after more than 20 years, reliance on the Columbia River to essentially flush uranium out of the vadose and periodically rewetted zones has not proven to be effective." Intentionally selecting a remedial alternative (Alternative 3a) with a proven track record as an ineffective remedy is misguided and fails to protect human health and the environment, the primary objective of remediation.

Energy has proposed natural attenuation for radioactive and chemically dangerous pollutants before. In the 300-FF-5 Operable Unit, Energy determined that even though hazardous substances exist in the groundwater above the cleanup standards, that "institutional controls" would be adequate to remedy ongoing violations of groundwater standards in the 300-FF-5 unit.¹ 300-FF-1 ROD at 61. The ROD states that "uranium concentrations in groundwater will decrease to less than remediation goals in approximately 3 to 10 years." *Id.* at 55. Energy's prediction was wrong; contaminant concentrations stayed static or even increased. *See generally Groundwater Monitoring Report for 2008*, Department of Energy, DOE/RL-2008-66 (March 2009) (Exhibit 9); *Investigation of the Hyporheic Zone at the 300 Area, Hanford Site*, Pacific Northwest National Laboratory, PNNL-16805 (October 2007) (Exhibit 10).

Specifically, almost all uranium concentration measurements are above the 30 µg/L cleanup standard, and are regularly above 100 µg/L within 10 feet of the Columbia River bottom. *Id.* at 6.1-8.3. While uranium may be the biggest risk driver, there are regular violations of the drinking water standards for a variety of hazardous substances that do not have aquatic criteria

¹ Contaminants which exceeded relevant standards (MCLs) in the 300-FF-5 unit were 1,2-DCE (maximum concentration detected was 130 µg/L and MCL is 70 µg/L), total uranium (maximum concentration was 150 µg/L and MCL is 30 µg/L), and TCE (maximum concentration was 5.4 µg/L and MCL is 5 µg/L) 300-FF-1 ROD, Pg. 46. According to the *Hanford Site Groundwater Monitoring for Fiscal Year 2008*, Department of Energy, DOE/RL-2008-66, Pg. 2.12-5 – 2.12-10, concentrations of uranium, cis-1,2-dichloroethene, tritium, and nitrate exceed drinking water standards in portions of the 300 Area; chromium concentrations do not exceed the drinking water standard (100 µg/L) but do exceed the aquatic standard (10 µg/L).

water quality standards throughout the 300-FF-5 OU. *See Groundwater Monitoring Report for 2008, Groundwater Monitoring Report for 2007*, DOE/RL-2008-01 (March 2008) (Exhibit 8).

EPA's National Remedy Review Board also faulted Energy for failing to "demonstrate the existence of lines of evidence" to support the agency's reliance on monitored natural attenuation. The National Remedy Review Board states:

Neither the package, the March 26th letter, nor the [Energy] presentation to the Board, gave any indication DOE has demonstrated the existence of lines of evidence, as discussed in the above referenced EPA guidance, to justify the MNA remedy. The Board does not support selection of MNA as a remedy or contingent remedy unless such lines of evidence exist.

A year later, Energy's Proposed Plan still fails to "demonstrate[]" the existence of lines of evidence."

Furthermore, Energy's model of attenuation is flawed. For example, the modeled attenuation of the uranium groundwater plume overlooks the problem that the treated contamination remains in place, and may become remobilized in the future due to changes in environmental conditions that include groundwater chemistry, groundwater elevations, or other factors.

E. The Proposed Plan Should Incorporate a More Protective Reference Dose for Uranium

Energy bases its Proposed Plan on a Maximum Contaminant Level (MCL) of 30 µg/L for uranium in drinking water. Proposed Plan at 17. One of the key factors in determining the MCL for uranium is establishing the reference dose (RfD) for uranium. EPA has identified (noncancer) kidney toxicity risk as the key factor in establishing the reference dose RfD for uranium. Uranium has been identified as a nephrotoxic metal (kidney toxicant), exerting its toxic effects by chemical action mostly in the proximal tubules in humans and animals. In severe cases, this type of kidney damage can interfere with reabsorption of proteins and ultimately lead to reduced renal function or renal failure. In 2000, EPA published a new RfD for uranium – 0.0006 mg/kg-day. *See* 65 Fed. Reg. 236. at 76713 (Dec. 7, 2000) (Exhibit 11). This RfD is significantly lower than the RfD used by the EPA's Hanford office to establish MCL's at Hanford, 0.003 mg/kg-day.

As identified by the Yakama Nation in its comments on the Proposed Plan, EPA's Office of Drinking Water and Groundwater has recommended the use of the lower RfD for uranium. A memorandum dated August 7, 2008, from EPA's Office of Environmental Assessment to EPA's Richland Hanford Office, encourages EPA's Hanford office to update the RfD value it used to establish cleanup levels at the Hanford site. According to the memorandum:

The IRIS RfD for soluble salts of uranium is based on what is probably the first uranium toxicity study, conducted as part of the Manhattan Project to provide information to inform occupational safety of workers handling uranium (cited by IRIS as Maynard and Hodges, 1943) (U.S. Environmental Protection Agency, 1989a; Voegtlin & Hodge, 1949). The IRIS profile has not been revised since 1989. In 2002, the IRIS program conducted a literature review for uranium which identified new relevant studies and concluded that, "*The literature published since the oral RfD for soluble uranium salts was derived (1989) contains study data that could potentially produce a change in the RfD.*" (Agency for Toxic Substances and Disease Registry, 1999; Gilman et al, 1998a; Gilman et al, 1998b; Gilman et al, 1998c; U.S. Environmental Protection Agency, 2002). These same studies were used by the Office of Drinking Water to prepare a uranium RfD for the revised MCL as part of a transparent, public, peer-reviewed process using up to date risk assessment methods (2000; U.S. Environmental Protection Agency & U.S. Geological Survey, 2000).

EPA Memo, Recommended toxicity value for uranium, noncancer endpoint for the Hanford Nuclear Reservation Site (Aug. 7, 2008) (emphasis in original) (Exhibit 12). As the result of the review described above, the Office of Drinking Water and Groundwater recommended lowering the reference dose for uranium from 0.003 mg/kg-day to 0.0006 mg/kg-day. Thus far, EPA's Hanford office has not adopted the lower RfD in its review of cleanup plans.

Riverkeeper urges Energy and EPA to use the lower, more protective RfD value (0.0006). By using this value, the cleanup level for groundwater would likely drop dramatically from 30 µg/L to 10 µg/L. Energy should assess its cleanup approach with the more protective cleanup standard – an analysis that would likely show that its preferred alternative would not meet the cleanup standard for a much longer period of time than targeted RTD. EPA should require Energy to use the best available scientific information to establish MCLs, including the lower RfD value.

F. Additional Characterization of the Operable Unites is Necessary.

Multiple instances of Energy and its contractors discovering previously unidentified contamination underscores the importance of full characterization of the nature and extent of contamination in the 300 Area. This analysis is not complete. For example, eleven wells were drilled as part of the characterization effort performed for the 300 Area RI/FS. However, characterization efforts were focused on only five identified waste sites. Of the eleven wells drilled, seven were focused on further refining already identified groundwater contamination. Without additional site characterization, it is not possible to identify the remedial actions that are necessary to completely remediate the 300 Area.

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G. The Incomplete and Flawed River Corridor Baseline Risk Assessment is not an Appropriate Source for Risk Assessment Metrics in Energy's Proposed Plan.

The Proposed Plan relies on a document, the River Corridor Baseline Risk Assessment (RCBRA), that state and federal agencies, as well as the Hanford Advisory Board, deemed severely flawed. *See* Hanford Advisory Board Advice No. 246 (June 3, 2011) (Exhibit 13); Letter from EPA to the Hanford Advisory Board (Sept. 16, 2011) (Exhibit 14). Riverkeeper urges Energy to consider input on the RCBRA and revise the RCBRA. Until Energy finalizes the RCBRA and resolves issues raised by TPA agencies, the Yakama Nation, and others, the agency should refrain from relying on its conclusions in cleanup plans, including the Proposed Plan.

For example, both the Proposed Plan and the RCBRA fail to address adequately the cumulative chemical and radiological risk of contaminants that are likely to enter the 300 Area from outside its boundary as a result of migrating plumes from other areas of the Hanford site. For example, uranium, iodine-129, and other contaminants are expected to flow from the Central Plateau through groundwater into the 300 Area for hundreds of years. The Proposed Plan should not rely on the RCBRA, which has unresolved flaws, such as relying heavily on institutional controls and lacking analysis of plumes entering the River Corridor from the Central Plateau over the long term.

H. Energy Must Consult with the Services Under Section 7 of the Endangered Species Act.

Pursuant to Section 7 of the Endangered Species Act (ESA), Energy must consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (collectively "the Services") to determine how the proposed action may affect any threatened or endangered species in the Columbia River. Riverkeeper has raised this issue in multiple comments on Hanford cleanup and other federal actions at Hanford. *See* Columbia Riverkeeper Comment on Mercury Storage at Hanford (Aug. 2009); Columbia Riverkeeper Comment on Tri-Party Agreement Proposed Changes and Consent Decree (Dec. 2009); Columbia Riverkeeper Comment on Tank Closure Waste Management Environmental Impact Statement (May 2010). To date, Energy has failed to engage in Section 7 consultation as required under the ESA.

Section 7 of the ESA is the heart of the ESA's requirements for federal actions. Specifically, Section 7 imposes strict substantive and procedural duties on federal agencies to ensure that their activities do not cause jeopardy to listed species or adverse modification to their critical habitat. 16 U.S.C. § 1536(a)(2). The ESA mandates consultations to ensure that an agency action "is not likely to jeopardize the continued existence of any" listed species or adversely modify critical habitat. 16 U.S.C. § 1536(a)(2). Because Energy's Proposed Plan may affect listed species and critical habitat, Energy has an affirmative duty to consult with the Services.

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CONCLUSION

Riverkeeper urges Energy to evaluate a broader range of alternatives. We look forward to working with Energy on the monumental task of protecting the public and future generations from Hanford's nuclear legacy. Thank you for considering Riverkeeper's input on the proposed cleanup plan for the 300 Area.

Sincerely,



Daniel Serres
Conservation Director
Columbia Riverkeeper



Lauren Goldberg
Staff Attorney
Columbia Riverkeeper

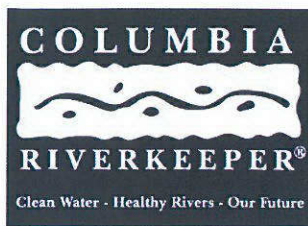
cc w/o enc:

Russell Jim, Yakama Nation
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Ken Niles, Oregon Department of Energy
Max Powers, Oregon Hanford Cleanup Board
Steve Hudson, Hanford Advisory Board

enc.

**EXHIBITS TO COLUMBIA RIVERKEEPER 300 AREA CLEANUP PLAN PUBLIC
COMMENTS**

Exhibit No.	Title
1	GW Patton <i>et al.</i> , <i>Survey of radiological and chemical contaminants in the near-shore environment at the Hanford Site 300 Area</i> (March 2003) (PNNL-13692, Rev. 1)
2	Letter from Yakama Nation to EPA and Energy (Sept. 10, 2013)
3	EPA, Response to HAB Advice #257, "300 RI/FS and Proposed Plan" (July 9, 2012)
4	National Remedy Review Board, Recommendations for the 100-K, 200-UP-1, and 300 Area of the Hanford Superfund Site (June 26, 2012)
5	Letter from Yakama Nation to EPA (Aug. 3, 2012)
6	PNNL-18529, <i>300 Area Uranium Stabilization Through Polyphosphate Injection: Final Report</i> (June 2009)
7	Energy, <i>Hanford Site Groundwater Monitoring Report, 2011</i> , DOE/RL-2011-118, Rev. 0
8	Energy, "Hanford Deep Dig Removes Contaminated Soil" (March 11, 2013)
9	<i>Groundwater Monitoring Report for 2008, Groundwater Monitoring Report for 2007</i> , DOE/RL-2008-01 (March 2008)
10	<i>Investigation of the Hyporheic Zone at the 300 Area, Hanford Site</i> , Pacific Northwest National Laboratory, PNNL-16805 (October 2007)
11	65 Fed. Reg. 236 (Dec. 7, 2000)
12	EPA Memo, Recommended toxicity value for uranium, noncancer endpoint for the Hanford Nuclear Reservation Site (Aug. 7, 2008)
13	Hanford Advisory Board Advice No. 246 (June 3, 2011)
14	Letter from EPA to the Hanford Advisory Board (Sept. 16, 2011)



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July 24, 2013

Dennis Faulk
U.S. Environmental Protection Agency
Hanford Project Office
309 Bradley Landing, Suite 115
Richland, WA 99352

Kevin Smith, Manager
U.S. Department of Energy
Richland Operations Office
PO Box 550
Richland, WA 99352

Jane Hedges
Nuclear Waste Program Manager
Washington State Department of Ecology
3100 Port of Benton Blvd.
Richland, WA 99354

Via email: 300AreaPP@rl.gov

Re: Request to Extend the Comment Period for the Proposed Cleanup Plan for Hanford's 300 Area

Dear Mr. Faulk:

Columbia Riverkeeper is requesting that the Tri-Party agencies extend the public comment period for the Proposed Cleanup Plan for Hanford's 300 Area (Proposed Plan) by at least 30 days.

On July 15th, the Tri-Party agencies released more than 5,000 pages of analysis including the Proposed Plan for Remediation and the Remedial Investigation/ Feasibility Study of the 300-FF-1, 300-FF-2 and 300-FF-5 Operable Units. The sheer breadth of these documents is enough to warrant an extension of the 32-day comment period.

However, Columbia Riverkeeper asks you to also consider the following:

- The Proposed Plan analyzes new technology, the injection of phosphate into the vadose zone to stabilize uranium in the soil. This is the first time the Tri-Party agencies have presented the public with detailed information about

this technology and pilot testing analysis. The Tri-Party agencies have put forward a preferred alternative that relies on this technology. The public needs more than 32 days to begin to understand, review and comment on the use of this preferred technology.

- The Proposed Plan covers an area of forty square miles including ten square miles adjacent to the Columbia River. This is the first Record of Decision in the River Corridor. Every other cleanup action in the 300 area has been conducted under an interim Record of Decision. Therefore, whether and how the Tri-Party agencies' educate the public and solicit comments may set a precedent for any future Record of Decision in the river corridor. It is important to get it right the first time by allowing adequate time for public participation.
- The Hanford Advisory Board will not meet during the public comment period. The primary mission of the Hanford Advisory Board is to provide informed recommendations and advice to the Tri-Party agencies on major policy issues related to the cleanup of the Hanford Site. The Hanford Advisory Board will not have an opportunity to submit guidance to the Tri-Party agencies on the Proposed Plan unless the agencies extend the comment period.
- The public comment period for the Cleanup Plan was originally scheduled to take place in the fall. Recently, the agencies pushed the comment period forward into the summer, when many members of the public vacation and juggle work and childcare responsibilities. This schedule change will likely diminish public participation.

For the foregoing reasons, Columbia Riverkeeper asks the Tri-Party agencies to immediately extend the public comment period for the Proposed Plan by at least 30 days.

Sincerely,

Theresa Labriola
Hanford Coordinator

From: Mike Conlan <mikeconlan@hotmail.com>
Sent: Wednesday, July 17, 2013 11:37 AM
To: ^300 Area Proposed Plan
Subject: 300 Cleanup Plan

Kim Ballinger:

I am responding to the Proposed Cleanup Plan for Hanford's 300 Area.

In a nutshell the entire Hanford nuclear waste should be cleaned completely. Area 300 being near the Columbia River needs to be cleaned thoroughly and should have been done 20 years ago!

Alternative 3a is the preferred alternative ??

All the single skin storage tanks need to be replaced – and the contaminated soil around them taken care of.

Until Hanford cleans up its own mess – no more nuclear waste !

Hanford is the most polluted spot in the U.S. – and it is leaching into the Columbia River !!

Mike Conlan
Redmond WA

**Public Comment on DOE/RL-2011-47, Rev. 0, Proposed Plan for the 300-FF-1,
300-FF-2, and 300-FF-5 Operable Units**

Larry C. Hulstrom
7/17/13

General Comments

1. The announcement for this proposed plan that was sent out to the public failed to specifically identify the document number (i.e., DOE/RL-2011-47), which made it somewhat challenging to access the document through the Administrative Record. The Hanford Events Calendar on the DOE home page also did not provide access to the document nor indicate on the calendar that there were upcoming public meetings, which had been so stated in the announcement.
2. Inserting bookmarks for the various sections of the document into the pdf file would improve review and readability of the document. Be sure those provided actually work. This includes DOE/RL-2010-99 where links to individual document chapters should have been provided.
3. As a former technical lead for the investigation of these operable units I know that there was far more investigation work done between 1990 and 2003 and topical reports issued then what is mentioned in the proposed plan. Figure 12 acknowledges the timeline and major documents but this proposed plan seems to rely heavily on DOE/RL-2010-99 (Appendix N) and PNNL issued documents supporting that RI/FS. Appendix N is incomplete. This proposed plan should more fully acknowledge what was accomplished in earlier investigations so the public is aware of those efforts.

Specific Comments

1. On page 19, Figure 10, the footnote on the bottom regarding waste site 300-293 implies that the waste site is not shown on the figure but there are multiple labels on the figure for this waste site. Also note the label overlap just below UPR-300-48.
2. On the bottom of page 37 the discussion regarding pipeline excavation indicates that only those pipelines above 3 m (10 ft) will be removed. This is inconsistent with the discussion elsewhere such as on page 40 (Figure 14) where excavation to 4.6 m (15 ft) is specified. Additionally on this figure and others it is specifically stated that excavation of 300-15 pipelines will occur to "variable depths" which implies going to depths in excess of 15 ft. Please clarify the text on page 37.
3. On page 45 in the discussion of Alternative 3a it would be helpful to add text to make it more clear here what the differences are between this alternative and Alternative 3. It wasn't apparent until later when comparing figures 17 and 18 that Alternative 3a is focusing the enhanced attenuation in the area south of 316-5.
4. Alternatives 3 versus 3a discussion – Figure 11 (pg 20) indicates that the uranium plume at high river stage is located more to the north in 316-5 than the area to be addressed by Alternative 3a which places the treatment area in the "area of highest uranium concentration". Justify constraining the treatment area to just this area when it fails to address the larger areas of contamination and does not address the southern uranium

plume. The additional \$108 million to completely resolve the uranium issues for Alternative 3 may be warrant further consideration. Conversely, build a stronger case for proposing Alternative 3a.



Oregon

John A. Kitzhaber, M.D., Governor



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September 13, 2013

Mike Thompson
U.S. Department of Energy, Richland Operations
P.O. Box 550, A7-50
Richland, Washington 99352

Dear Mr. Thompson,

Oregon appreciates the opportunity to review and comment on important clean-up decisions, such as the **Proposed Plan for remediation of the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (DOE/RL-2011-47, Draft A)**, and the **Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (DOE/RL-2010-99, Draft A)**.

Oregon provides these comments to supplement comments previously submitted by Oregon in January 2010 regarding earlier versions of these documents. We believe it is important to add our perspective to the planned remediation of the 300 Area groundwater uranium plume because of the potential impacts to the Columbia River.

Earlier attempts at a groundwater remedy at Hanford's 300 Area have mostly relied on natural attenuation. None of these have been successful. It is important to Oregon that the final 300 Area decision is dependable, protective, defensible, and well supported.

These 300 Area documents propose an application of polyphosphate to the most contaminated vadose zone locations with the intent that it would bind with uranium, thereby limiting its ability to migrate into the Columbia River. Uranium contamination less deep in the soil has been removed and disposed, and deeper contamination has been removed from the aquifer by river-stage induced groundwater flux. This remedial approach focuses on the uranium in the periodically rewetted part of the deep vadose zone between those depths.

We do have concerns about the effectiveness of polyphosphate in creating autunite (or any other phosphate mineral) and thereby successfully lowering the dissolved uranium in groundwater. We are also not convinced of the longevity of this technology to hold the bound uranium for a period of time that could be deemed protective for the long term. There are a number of articles (many from Pacific Northwest National Laboratory) that demonstrate that this technology will not work in the high pH soils of Hanford.

Oregon supports a test of the polyphosphate remedial technique. Because of 300 Area groundwater and other areas of uranium contamination at Hanford that could benefit from a phosphate sequestration technology, we hope the technique will prove successful. However,

because of the uncertainty of the technology at this point, we do have concerns about moving directly to full-scale treatment without a testing phase.

Oregon is also disturbed by the fact that the new alternative, Alternative 3A, greatly scales back the proposed treatment area. Rather than test the uranium sequestration technology over a small area (3-4 acres) of highly contaminated vadose zone and then apply it over a larger area of contaminated vadose zone (as in the previously preferred Alternative 3), DOE now proposes to only apply the technique over the identified 3-4 acres of highest uranium contamination and do nothing further. This approach would allow a large amount of uranium contamination to continue to reside in the vadose zone, where it will continue to dissolve and enter the groundwater for decades to come.

Oregon believes other proposed alternatives need to be considered more fully. The Proposed Plan's Alternative 4 combines selected remove-treat-disposal (RTD) in combination with polyphosphate application. Oregon favors this alternative which selectively removes concentrated contamination in the vadose zone soils, and applies phosphate for uranium sequestration to the surrounding moderately-contaminated areas to bind vadose zone uranium in-situ. Phosphate solution could also be considered for use as dust suppressant during RTD to mineralize uranium normally liberated by the application of water.

Much of this Proposed Plan is based on complicated groundwater-vadose zone modeling, which in turn is based on characterization. Oregon is not convinced that sufficient vadose zone (nor groundwater flux) data has been collected to produce a model that can be relied on to predict the entire and actual location of the uranium plume(s) which is needed to maximize the effectiveness of this uranium sequestration approach.

We are also concerned that if this technology proves ineffective, that DOE plans to resort to natural attenuation, rather than active remediation. Given the recognition that natural attenuation has already been proven as ineffective, a more robust backup strategy is necessary.

If you have any questions or comments about our recommendations, please contact Dale Engstrom of my staff at 503-378-5584 (or dale.engstrom@odoe.state.or.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Ken Niles", with a stylized, cursive script.

Ken Niles
Administrator, Nuclear Safety Division

cc: Dennis Faulk, U.S. Environmental Protection Agency
Jane Hedges, Washington Department of Ecology
Stuart Harris, Confederated Tribes of the Umatilla Indian Reservation
Russell Jim, Yakama Indian Nation
Gabriel Bohnee, Nez Perce Tribe



September 16, 2013

Kim Ballinger
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, A7-75
Richland, WA 99352
Via Email to: 300AreaPP@rl.gov

Re: Hanford Challenge Comments on the Proposed Plan and Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units.

Dear Ms. Ballinger,

Hanford Challenge is an independent 501(c)3 organization based in Seattle, WA which exists to help create a future for Hanford that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Hanford Challenge collaborates with NW stakeholders, including the Hanford workforce, Tribes, Hanford Advisory Board members, community organizations, and concerned citizens to advocate for safe and protective cleanup remedies at the Hanford Nuclear Site.

Hanford Challenge maintains a membership base of around 1,600 people and an extended network of 179,798 people who receive our regular updates about Hanford cleanup. Many of Hanford Challenge's members live, work, and/or recreate on and around the Columbia River. Others work at Hanford and/or have a strong interest in assuring the protection of Columbia River and the groundwater that feeds it. Hanford Challenge advocates for worker health and safety to ensure that those on the front lines of environmental remediation at Hanford are adequately protected.

Hanford Challenge appreciates the opportunity to review and provide comments on the proposed plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units (300-Area) at the Hanford Nuclear Site.

Hanford Challenge supports a cleanup plan that actually removes uranium and other contaminants, prevents further groundwater contamination, and protects future generations from ongoing pollution. In short, Hanford Challenge believes the current Preferred Alternative (3a) is not sufficiently protective and is inconsistent with anticipated future land and groundwater use. The current Preferred Alternative neither furthers the cleanup of the 300-Area to the maximum extent possible nor proposes a permanent solution in a cost effective manner.

The current plan proposes abandoning much of the residual radioactive and toxic pollution in the 300-Area. The preference to remove, treat and dispose of waste (RTD) only down to 15-feet of soil and then rely on "enhanced attenuation" and "natural attenuation," along with experimental technology, to attempt to immobilize uranium in the ground is wholly insufficient. There must be a backup plan in case the experimental technology is not effective. Furthermore, the current

proposed approach (polyphosphate treatment) does not remove the potential for future remobilization or migration due to a change climate or river levels.

The current proposed plan for 300-Area cleanup also fails to answer some important questions about the cleanup of the area.

Because uranium sequestration is untested- will it work? How will we know? Current criticism of this approach is that it will allow a large plume of uranium contamination to continue to reside in the vadose zone, continuing to dissolve and enter the groundwater. How will the Agencies assess whether uranium has been stabilized and the spread of contamination controlled?

What is the backup plan? Hanford Challenge is also concerned that if the chosen technology for sequestration proves ineffective, that DOE plans to resort to natural attenuation, rather than active remediation. Given the recognition that natural attenuation has already been proven as ineffective, a more robust backup strategy is necessary. If uranium sequestration doesn't work, what is the plan to prevent more uranium from getting into the groundwater or the river? Without a backup plan in place, there is no guarantee the 300 area will ever be clean or safe.

Why not actually remove, treatment and dispose of all contaminants? RTD is often the most effective way to clean up contamination. Several contaminants, including tritium, Trichloroethylene (TCE), and cis-1,2-dichloroethene, are being managed using monitored natural attenuation (essentially, doing nothing). Why was this choice made? Are there other options that would clean these contaminants up faster and more effectively? MNA would not achieve the cleanup goals in a timely, safe, or effective manner.

The models are insufficient – How will we know that the sequestration approach is effective? Much of the Proposed Plan is based on complicated modeling, which in turn is based on characterization. Hanford Challenge is not convinced that there has been enough vadose zone (nor groundwater flux) data collected to produce a model that may be relied on to predict the entire location of the uranium plume(s) or the effectiveness of this sequestration approach.

Where is the environmental justice analysis for Preferred Alternative (3a)? The Preferred Alternative (3a) lacks discussion of how it results in *minimal(if any) impacts to environmental justice*. The philosophy underlying the cleanup of Hanford should be guided explicitly by the goal of allowing Native Peoples to safely live the lifestyle to which they are entitled and prevent Native Populations from suffering disproportionate impacts. The analysis of the preferred alternative should also incorporate non-quantitative elements into the Preferred Alternative such as the spiritual or cultural value of a site.

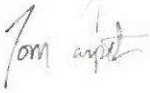
Conclusion

Hanford Challenge would like to see a better analysis of the uranium plume to ensure the plan is based on sufficient understanding of uranium soil concentrations, the plume contamination distribution and the migration pathways to ensure full remediation as well as deeper removal, treatment, and disposal of waste and contaminated soil.

Hanford Challenge asserts that the entire 300-Area should be cleaned up to unrestricted use standards to ensure the environment, including the Columbia River, is adequately protected from migrating contamination. The current proposal to clean up only parts of the area to residential standards leaves the rest of the area to industrial standards which must be fenced off and guarded forever.

Hanford Challenge expects the Department of Energy to seriously consider the comments of Hanford stakeholders and make cleanup decisions that will sufficiently protect the environment and human health for current and future generations. We look forward to your response to our comments.

Sincerely,



Tom Carpenter, Executive Director
Hanford Challenge
tomc@hanfordchallenge.org
206-419-5829



Meredith Crafton, Policy and Advocacy
Hanford Challenge
meredithc@hanfordchallenge.org
206-280-7011

Tri-Party (US DOE, WA Dept of Ecology & US EPA) Call for Citizen Testimony for the Hanford 300 Area Clean Up, September 16, 2013

Testimony from Washington Physicians for Social Responsibility(WPSR), July 31, 2013 on Plutonium Wastes at the Hanford Complex

Contact: Tom Buchanan, Board member, Washington Physicians for Social Responsibility, Seattle Washington, www.WPSR.org

In a study released on July 7th, 2010, Robert Alvarez, Institute of Policy Studies Senior Scholar, Washington, DC, released "Plutonium Wastes from the US Nuclear Weapons Complex". Much of his analysis applies directly to the Hanford facility and it's Waste Streams. We thank Bob for his truly "ground breaking" analysis of the plutonium wastes at Hanford and the other nuclear weapons production complexes.

1. From 1944 to 2009, his research recorrects a total of 12.7 metric tons of plutonium discarded at US weapons production facilities. This is THREE TIMES more than the US DOE's official waste losses (3.4 tons) calculated in 1996.
2. Alvarez calculated that in addition to the high level liquid waste stored in tanks and as granulated material (2.7 tons); and the 7.9 tons in solid and liquid wastes that are planned to be deposited at a transuranic WIPP site, there is now estimated 2.1 tons of plutonium solid and liquid wastes dumped, buried and traveling in the soil prior to 1970, at several US DOE sites. The US DOE considers this waste to be already permanently disposed. We at WPSR do not.
3. The Hanford complex has nearly 1/3 of the US DOE's plutonium wastes (4 tons, more than any other US weapons' sites) and it plans to leave 0.7 metric tons behind in the ground AFTER the environmental clean up.
4. Alvarez's paper does not address the 7.6 tons of plutonium contained in the DOE spent reactor fuel inventory, the 61.5 tons of plutonium declared 'in excess' for weapons purposes or the entire spent fuel (including plutonium) of the US nuclear reactor industry.
5. Alvarez corrects the DOE's official plutonium estimates (1996) of about "2% of the total plutonium produced at Hanford went into waste streams(1.35tons)". His 2010 calculations indicate "6% of the plutonium levels went into waste streams (4 tons)." But worse, 2.7 tons of that 4 tons of plutonium were in liquid and solid forms which were mostly discharged, buried and leaking into the Eastern Washington Hanford soil.
6. A recent study by DOE finds that plutonium in the groundwater could reach the

Columbia River in less than 1000 years at concentrations 283 times greater than the Federal drinking water standard. (DOE/EIS-0391, Appendix U , Table U-2). Alvarez's paper quotes: "Currently based on borehole measurements, plutonium vadose zone contamination at Hanford is relatively uniform with depth and exceeds the 100nCi/gm limit required for removal and geological disposal at depths greater than 100 feet. Deep vadose zone contamination at Hanford appears to be orders of magnitude greater than at DOE's Idaho site, which has a greater concentration of buried TRU wastes. Migration beneath Hanford disposal sites has been enhance by solvents, acids adn concentrated salts. Moreover, plutonium has migrated to groundwater beneath the Hanford site."

7. Long term migration of plutonium depends on how readily plutonium sorbs to the surface of soil particles. The higher the Kd Sorb value, the more the plutonium is held up by the soil. DOE's current site model uses a Kd soil value of 150 even though most of the Kd values measured at Hanford are below ten. (DOE/EIS-039, Appendix M, Table M-10). This Kd sorb value means plutonium particles of waste are traveling up to 15X faster underground at the Hanford 'areas', including the 300 area next to the Columbia, the only nuclear power plant in the NW, the Columbia Generating Station (CGS), several 'hot spots', like the burial cribs, 618-11 (underneath the CGS parking lot) and 618-10 which are less than 2 miles from the Columbia River.

8. Hanford should be required, as is the Idaho National Labs, to remove and process buried and dispersing plutonium prior to 1970 in the ground and prepare it for long term geological disposal. This digging for plutonium means using remote equipment to dig down much further down than the DOE's present 15 foot average. The US DOE must test more systematically and dig at least 100 feed down to get at the deeply migrating plutonium under their site.

9. Besides deep excavation into the so-called 'Vadose' dry underground and into the Hanford water table to rescue the plutonium wastes, we recommend the trenching of entire 300 Hanford area, just north of Richland Washington and just West of the Columbia River to dig and dispose of the uranium and suspected plutonium wastes that are in that area.

We also agree with the nuclear engineer, Arnie Gunderson, to use the nuclear absorbent material, Zeolite, which is now used at the US' oldest reprocessing facility, West Valley New York, to help adsorb the nuclear waste coming downstream in the Hanford underground to the Columbia.

10. The surrounding Hanford environment should not be exploited for the expedient storage of nuclear waste. We agree with Jay Inslee, our Governor, "Washington State is imposing a 'zero tolerance' policy on radioactive waste leaking into the soil."

Plutonium-239 is a particularly dangerous with it's long half-life of 24,000 years, and a

specific activity of about 200,000 times greater than uranium. Plutonium emits alpha particles that lose energy quickly within living tissue, whether a human, a fish or a duck. Particles less than a few microns in diameter can penetrate deeply into the lungs or gills and lymph nodes. Research recently has measured significant health issues, such as an increase in cancer reported among workers following exposure to plutonium. The DOE has conducted and found plutonium in fish samples caught in the Columbia off the 100 and the 300 area sites. These samples were not conducted in a identified grid pattern in the water, and are not easily repeated. But it does note the seriousness of the arrival of plutonium nuclides with their beginning impact on the living food chain in the river. (DOE/RL-2010-117,2012, Columbia River Risk Assessment, Vol.1)

11. Further, we recommend the shutdown of the only nuclear power station in the Northwest, the Columbia Generating Station(CGS).

We understand from US DOE analysis that one of the "hotspot" burial sites (out of 134 such sites) in the 300 area, is the 618-11 Burial Ground located at area 300-FF-2 is under the West parking lot of the CGS reactor site. Decommissioning activity at the reactor site should be especially concerned about the "challenging waste hotspot" on their property.

Since Fukushima, we realize how the storage of the so-called 'spent fuel' in the accident prone water storage pits 5 stories above the reactor core is inherently unstable and dangerous. The 40 tons of highly radioactive 'spent fuel' produced every year at CGS and then condensed into crowded storage racks in the water pit has to be stopped. We demand that Energy Northwest's CGS highly radioactive fuel be immediately stored in the more stable and safe concrete dry casks at the site. Let's stop added more dangerous waste to Hanford area where the 50 years of plutonium wastes, its processing acids and chemicals are still moving toward one of greatest natural resources in the NW, the Columbia River.

Jane Camero
1027 Columbia St
Hood River, OR 97031
541-386-3307

Kim Ballinger
US Dept of Energy
Richland Operations Office
PO Box 550 A7-75
Richland, Wa 99352

08-18-2013

Dear Department of Energy,

I am not a physicist, a scientist or an expert in chemical and radiation toxicity. I am a nurse of 37 years and do not pretend to know answers to all the tough questions at hand for nuclear waste cleanup at the Hanford Reservation. I moved to the banks of the Columbia River in 1986 from the banks of the Chena River, Alaska. At that time my greatest concern was being downstream from Hanford and it remains my greatest concern today.

It is time to reset goals. The 300 Area is no longer "industrial". Cleanup should reach far past the industrial cleanup standard (MTCA) to a standard safe for unrestricted use, making it safe for the tribal and recreational fishing that is already going on. We must uphold treaty rights and make it safe for the unlimited uses that the future may bring.

I am in favor of the most complete cleanup possible. The proposed 3a, enhanced attenuation is not stringent enough. 22 years is too long to wait for groundwater to be cleaned up to safe levels along the Columbia. We need to require removal of contamination in the soil above the groundwater. We need to be following state and federal laws which require "permanent remedies"! 15 feet is not nearly an adequate depth to remove the Uranium and other contaminants that USDOE historically and until the mid 1990's dumped into the groundwater. 30 to 40 feet depth is more realistic to meet the removal, treatment and disposal (RTD) of contaminated soil. Money must be spent to complete cleanup and protect the groundwater and the Columbia River.

We cannot wait decades to clean up the soil. Injecting phosphate to hold the Uranium in place does not remove or remove the risk of the contamination. It merely binds it in place. Since sequestration is experimental, it cannot be depended on. Since the future of the Hanford 300 Site is unknown, radioactivity and soil toxic with Uranium must be completely treated now. We must prevent exposures!!

Children and future generations must be protected. Cleanup levels need to seek to reduce exposures to 2millirem per year. We must meet the EPA's Superfund (CERCLA) requirement that radiation risk not cause more than one additional cancer for every 10,000 people exposed. Day in and day out I see the devastating effect cancer has on human life. Risk estimates need to be updated. Women and children are now known to be more susceptible to get cancers and these sensitive populations must be protected.

The 300 Area is subject to high and low water level fluctuations. Clean up should be coordinated with

the dams. Such important issues cannot be dismissed as "DOA"! Cooperation should be negotiated with education for the good of humanity and the health of future generations. Should our grandchildren look back and ask, "How could they have left such blatant factors out of the clean up plan?"

It is my sincere hope that these recommendations will change the current endpoints. Multiple strategies need to be in place with back up plans. Thank you for taking public comment on the USDOE's Plan for Cleanup of Hanford's 300 Area.

Sincerely,

Jane Camero

September 16, 2013

Kim Ballinger
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MS A7-75
Richland, WA 99352

Re: Public Comment Hanford 300 Area Proposed Cleanup Plan

Dear. Ms. Ballinger:

I have attended many meetings, read books and took a tour of the B-Reactor last summer. All to gain some understanding of the magnitude of this problem of "clean up". If I am a bit overwhelmed and skeptical, I wonder how you must feel.

These clean up issues go on and on like a Laurel and Hardy movie. What seems to happen most is learning by making mistakes and mis-judgments. I don't mind that, but all of these efforts remain compartmentalized. From the very start in 1942, the activity of building the reactors, refining the uranium and plutonium, and using the land as a toxic dump affecting most of Washington and Oregon's water, air and land was compartmentalized to keep secrets. The consequences of these activities were neither contained nor compartmentalized. The historical record from all the declassified documents show knowledge of the pollution and environmental damage, from the records of the fish and water monitoring to those of the air. Yet, the attempt to bring all the contractors, federal and state agencies together in the Tri-party Agreement never resolved the issues resolving the clean up in pieces and not the whole.

I receive notices on all these comment periods for different actions and issues as if they didn't affect the other. My calendar is full and I really do not know how to address the issues as separate. Along the way, the wastes keep sinking downward into the groundwater and into the river. Other actions that add to and affect these areas do not get mentioned. Why isn't the storage of the nuclear reactors and waste from the USS Enterprise and other nuclear powered ships and submarines that are being dismantled and shipped from Bremerton a concern? What is the worst case scenario in your risk management plan for Area 300 as these reactors pass through?

Actually, I never hear nor read about a worse case scenario and Hanford is in the fault lines for some very large volcanoes, let alone what would happen if there was a tsunami that swept up the Columbia. What would flooding do to Area 300?

I really don't wish to address the issues brought up in your study until they are integrated into an overview of the whole area of the Tri-Party agreement. I would ask to incorporate the comments from Heart of America Northwest. They have carefully studied, mapped and documented the history. There is depth and knowledge in what they say.

I know that you all recognize what is real and what is true. Once the bomb went off in Nagasaki, there were no secrets. The compartmentalization will not solve the environmental damage that continues to affect the land, air, water, flora and fauna.

Thank you for this opportunity to comment. Please include my thinking and letter as a part of the record. I will continue to follow the many papers, permits and proposals. I will attend meetings.

Ever onward!

Karin Engstrom

6911 34th Avenue SW
Seattle, WA 98126
kepicturewoman@gmail.com

Public Comment on “Proposed Plan for Remediation of the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units” (DOE/RL-2011-47, Rev. 0)

Robert Peterson
Richland, Washington
(509) 375-7495
September 16, 2013

The following comments are focused on the groundwater aspects of the Proposed Plan. The commenter is an earth scientist who has been involved in Hanford Site groundwater investigations under multiple Site contractors and the Pacific NW National Lab, with experiences focused on groundwater contamination in areas near the Columbia River and, most recently, the 300 Area. The comments and opinions that follow are his own and are independent of positions taken by his previous employers at the Hanford Site.

Comment #rep-01 General comment on impressions made in the Proposed Plan

For groundwater associated with the 300-FF-5 Operable Unit, the preferred remedial action alternative relies strongly on continuing to monitor contaminants in various groundwater pathways. While how that monitoring will actually be conducted is not specified in any detail, it will likely involve preparing a strategy for where, when, and how to collect samples; evaluation of the results of lab analyses to determine how representative the results are of actual conditions in the aquifer; to use the results to estimate the extent and predict the transport of contamination via the groundwater system, including the groundwater’s ultimate discharge into the Columbia River; and finally to communicate the knowledge gained to stakeholders and the general public. The DOE and EPA are to be commended for highlighting the monitoring aspect of the Proposed Plan. It is important for keeping current and future stakeholders informed as the restoration of the Hanford Site continues and as stewardship of the Hanford Reach National Monument evolves.

Comment #rep-02 General comment on the Monitored Natural Attenuation (MNA) remedy

EPA guidance for a legal remedy to address groundwater contamination that poses a possible threat, but no real risk in the absence of viable or non-controllable transport pathways to receptors, is a welcome remedy for the 300-FF-5 operable unit. Had such risk been present and environmental degradation been occurring beneath the 300-FF-1 and 300-FF-2 waste sites during the past several decades, the impacts would have been revealed by the DOE’s Public Safety and Resource Protection Program, and by the Groundwater Monitoring Project. Fortunately, that has not been the case.

Under MNA, contaminants in 300-FF-5 groundwater can be characterized with regard to the level of contamination using a variety of measures, and not simply a concentration value in a sample from a well, where how representative the sample is of actual aquifer conditions is often poorly known. Determining the level of contamination can be done not only by monitoring concentrations in samples from locations where representativeness is reasonably well known, but also by estimating the volume of the contaminated groundwater and the mass of contamination within the plume using computer simulations. By manipulating concentration data within a 3-dimensional space that is based on geologic conditions, reasonable estimates can be derived. Continuing this type of analysis over time will reveal a trend that provides insight as to when the plume will be reduced (‘attenuated’) to a level acceptable to regulators and the public. Public confidence will be enhanced and the taxpayer will find good value as this type of groundwater characterization work is carried out for 300-FF-5 groundwater and for other groundwater plumes at the Hanford Site.

Comment #rep-03 This Proposed Plan and the existing record-of-decision for interim remedial action

Remedial actions for groundwater beneath the 300 Area (i.e., 'Industrial Complex') and adjacent outlying waste sites currently are being conducted under a 1996 record-of-decision as part of the CERCLA process. For groundwater, the designated actions are continued monitoring of contaminants in groundwater while waste site and facility remedial actions are underway, along with institutional controls on the use of groundwater. Since the CERCLA process began in the late 1980's, this has been an acceptable course of action for contamination that has entered environmental pathways; no additional risk to human health and the environment, including the adjacent Columbia River, has apparently been revealed that would drive additional remedial actions other than those already underway by Hanford Site contractors.

The preferred remedial action alternative for groundwater in the Proposed Plan (Alternative 3a and the 'common elements') offers essentially the same course of action, but with thus far still incomplete treatability testing and computer simulation of contamination in environmental pathways...work that would provide insight on future conditions and strengthen the technical basis for the record-of-decision. This work, typically conducted during the remedial investigation/feasibility study phase of the CERCLA process, is apparently being pushed forward into the remedial design/remedial action work plan process. Please provide additional text to help stakeholders understand why this sequence of activities has come about. Also, offer more information to stakeholders as to what has been added to the technical and regulatory basis for revisiting the decision for remedial actions. Provide additional discussion up front that highlights the importance of what has been done to substantiate that the decisions presented in this Proposed Plan are consistent and more strongly supported, in some aspects, with decisions made earlier. If this is not done, it is hard to substantiate the time, effort, and funding expended to get to this Proposed Plan.

Comment #rep-04 Use of polyphosphate to immobilize uranium (Alternative 3a, preferred alternative)

Attempting to proceed with polyphosphate infiltration as a means to immobilize uranium that is suspected of continuing to resupply the groundwater plume is premature. Initial lab experiments and field testing of polyphosphate solutions at the 300 Area have shown the potential for success but have not demonstrated the viability with regard to reducing concentrations in the plume over the long term. Moreover, field work to measure the potential success of those treatability tests was not completed. Since treatability tests are a necessary part of the CERCLA process prior to proposing a plan of action under a record-of-decision, it seems out of order to push that work forward into the remedial design/remedial action work plan. Please provide an explanation or rationale for doing so under the current Proposed Plan, or consider delaying the final version of the Proposed Plan and subsequent record-of-decision until a more firm basis for the alternative is available.

Comment #rep-05 Consideration of planned removal actions (Alternative 3a, preferred alternative)

Figure 17 of the Proposed Plan outlines the target area for Phase I of the preferred remedy. This relatively small area contains a spur of the process sewer system that delivered uranium-contaminated effluent to the North Process Pond (see Figure 4.92 in Chapter 4 of the RI/FS report). The small area has been identified as a suspected location where relatively mobile uranium has been resupplying the groundwater plume on a regular basis, i.e., when the water table is elevated during each seasonal period of high Columbia River conditions. Evidence supporting this comes from groundwater monitoring

results, nearly certain leakage from the sewer during its years of operations, and the appearance of uranium in samples collected during recent drilling (see Figure 4-55 in Chapter 4 of the RI/FS report).

The process sewer spur is scheduled for removal by Washington Closure Hanford as part of its Zone 7 work. The contractor will remove the sewer pipes as well as any surrounding soil that is contaminated above a certain level; typically, soil removal will continue laterally and downward until a sufficiently low level of contamination is found. At this location, there is a high probability that downward excavation would proceed nearly to the water table (note: excavation to the water table has been previously done at several locations in the 300 Area; see examples in Figure 4-58 and 4-59 in Chapter 4 of the RI/FS report). Removal of contaminated soil from this location would potentially reduce the amount of contaminant uranium being added to the groundwater plume, such that the seasonal increase in concentrations observed in the groundwater plume would be reduced. Please explain why selection of a remedial action alternative for groundwater is being done prior to this already planned source removal action, the latter possibly providing valuable insight for developing a Proposed Plan.

Comment #rep-06 Treatability testing of groundwater removal actions

An increase in uranium contamination in groundwater has been regularly observed at several locations whenever the water table is raised above a certain elevation during the seasonal cycle of the Columbia River (see map of locations, Figure 4-93 in Chapter 4 of the RI/FS report). Recent unusually high water table conditions have provided even greater focus on specific locations where contaminant uranium is being tapped by the high water table and subsequently drawn downward into the groundwater plume. Why haven't groundwater withdrawal tests been conducted to determine if a groundwater removal action would have a significant impact on the level of contamination in the plume? The availability of a resin system to treat the extracted groundwater (i.e., the same system used to remove chromium) and existing wells from which to pump groundwater suggest that a limited test would be relatively easy to arrange. The quick reference to pump-and-treat not being retained as an alternative is too brief for the general public, which typically views PNT as a ready solution to groundwater problems. Please discuss the omission of pump-and-treat treatability testing from the CERCLA process for groundwater at some point in the Proposed Plan, and consider adding a bit more text on why it was removed as a viable alternative. After all, the issue as presented focuses on uranium concentrations in groundwater, not the mass of uranium in environmental pathways and compartments, much of which may be essentially immobile.

Comment #rep-07 Criteria for acceptable groundwater conditions

The argument put forth in the Proposed Plan for either doing something to immobilize uranium in the lower portion of the soil column ('vadose zone'), the zone through which the water table fluctuates vertically ('periodically rewetted zone'), and the upper portion of the unconfined aquifer, states that the objective for such action is to restore the groundwater to meet drinking water criteria. No other drivers for remedial action beyond continued monitoring are offered, such as reducing risk to potential receptors, human and otherwise. If a future need to exploit the aquifer for 'maximum beneficial use' appears, that requirement would be mitigated by the abundant nearby opportunities to extract uncontaminated groundwater, as has been done in the 300 Area to supply water for dust control and aquariums used in research (see PNNL-17666, Section 3.2, for discussion of drinking water supply via wells).

Finally, if the remedial action drivers are the drinking water criteria and NCP requirement to restore an aquifer to its maximum beneficial use, why is uranium the only constituent identified for possible remedial action? Why is it not simply included under the Monitored Natural Attenuation remedy? This suggests an inconsistency in the argument, since other constituents also are present at concentrations

exceeding the criteria. And if exceedance of regulatory criteria for drinking water are exceeded in a sample, that may be best characterized as a threat; the threat might turn into 'risk' if a pathway and transporting mechanism were present that would expose potential receptors. For human exposure, institutional controls and the highly unlikely need to exploit 300 Area groundwater in the foreseeable future should cause very minimal risk. As presented in the Proposed Plan, the explanation for why various constituents are treated as they are regarding regulatory standards for groundwater contaminants needs to be clarified.

Comment #rep-08 What constitutes exceedance of the Drinking Water Standards?

Without further discussion of how conditions in the aquifer might be represented by groundwater monitoring activities, it is not clear in the Proposed Plan how exceedances of drinking water standards are actually verified, and how the strategy for monitoring conditions in the future would be designed to provide relevant information. For example, uranium concentrations in samples from wells with relatively short open intervals for sampling can be quite different than for samples from wells in the same area that have much longer open intervals. While putting together a strategy for this would be part of the remedial design/remedial action work plan process, considering the issue prior to a Proposed Plan and record-of-decision could avoid unnecessary scope for that work plan. Please provide additional explanation as to why concentration values for samples from a variety of well types would be sufficient justification to proceed with remedial action beyond continued characterization and monitoring of the contaminants in groundwater.

Comment #rep-09 Experience at other locations where groundwater is contaminated by uranium.

The DOE has invested in research at other sites around the country where uranium has contaminated groundwater. For example, the site at Rifle, Colorado, has conditions similar to those at the 300 Area. Some discussion of what was learned at that site, e.g., the remedial actions tested at that site, and how the plume is characterized by monitoring and computer simulations, would be a helpful addition to the discussion of treatment technologies that were reviewed as possible alternatives at the 300 Area.

CC: DOE-RL; EPA Richland

Ms. Jill Reifschneider

14846 74th Place NE

Kenmore, WA 98028

August 12, 2013

Ms. Kim Ballinger

U.S. Dept. of Energy

Richland Operations Office

Richland, WA 99352

Dear Ms. Ballinger:

Re: USDOE's Plan for Cleanup of Hanford's 300 Area

I understand that the EPA has given tentative approval to the USDOE's Plan for Cleanup of Hanford's 300 Area. This plan proposes to remove, treat, and dispose (RTD) contaminated soil to a depth of only 15 feet on contaminated sites. Instead, please **follow Washington's state cleanup law (MTCA)** and require all areas along the Columbia River to be cleaned up to a level safe for children and unrestricted future public uses. **Exercise the treaty rights of Tribes to live along and fish this stretch of the Columbia River.** Require the thorough removal of contamination in soil above the groundwater. Follow state and federal regulations that require permanent removal, treatment and disposal of contaminated soil. **Go the 30 to 40 feet deep that is required to fully remove uranium and other contamination which the USDOE dumped into the groundwater.** Do not rely on unproven or long-term removal proposals. Clean it up now and as thoroughly as possible. The USDOE's Plan does not clean up Hanford's 300 Area. Please hold them to standards that will protect people and our environment now. Thank you.

Sincerely,

Jill Reifschneider

Written comments can be handed in today, or mailed to:

Kim Ballinger, U.S. Department of Energy, Richland Operations Office, P.O. Box 550 (MSIN A7-75), Richland, WA 99352

or

E-Mail to: 300AreaPP@rl.gov

Comments need to be submitted by September 16, 2013.



Hanford 300 Area Proposed Plan

WRITTEN COMMENT FORM

(Please Print)

I have paddled the Hanford Reach & observed many users in the river. Paddlers, fisherman, osprey, deer, salmon, steelhead and many others. Unrestricted use must be the goal of any clean up. It's a beautiful part of the river.

It is very frustrating to hear monitored natural attenuation discussed for materials with such a long half life.

We are accepting contamination for decades / centuries / millenia. We must protect the river & stop uranium from entering the Columbia. It's the law & the right thing to do for our future.

Dilution is not acceptable. To simply monitor the contaminants & expect the river to dilute it to a "safe" standard is not clean up.

Dig up the worst contaminated soil & move the material away from the River. Treatment is unproven & will not protect groundwater or the River.

Beth Flalce

Name (optional)

Address (Street or e-mail)

Hood River, OR, 97031

City, State and Zip Code

Written comments can be handed in today, or mailed to:

Kim Ballinger, U.S. Department of Energy, Richland Operations Office, P.O. Box 550 (MSIN A7-75), Richland, WA 99352

or

E-Mail to: 300AreaPP@rl.gov

Comments need to be submitted by September 16, 2013.



Hanford 300 Area Proposed Plan

WRITTEN COMMENT FORM

(Please Print)

As a 16 year old and a frequent river user, the goal for clean-up should be unrestricted use.

I encourage you to completely clean the area so that no over contaminant will flow into the River.

Name (optional)

Address (Street or e-mail)

Hood River, OR, 97031

City, State and Zip Code

Written comments can be handed in today, or mailed to:

Kim Ballinger, U.S. Department of Energy, Richland Operations Office, P.O. Box 550 (MSIN A7-75), Richland, WA 99352

OR

E-Mail to: 300AreaPP@rl.gov

Comments need to be submitted by September 16, 2013.



Hanford 300 Area Proposed Plan

WRITTEN COMMENT FORM

(Please Print)

Alternative 3a of enhanced monitored natural attenuation is an unproven way to deal with the contamination problem.

I would ask you to dig up more of the contamination to keep the uranium out of ground water and out of the river.

The 300 area has contamination that is too close to the river and too high levels of uranium. It needs to be fully cleaned up, not just monitored.

I ask for a standard of unrestricted use for the standard that should be applied. Industrial use is not adequate.

Please keep uranium and other contaminants out of the river. Consider other options such as more digging up of the area.

Leslie Currens

Name (optional)

Address (Street or e-mail)

Austin TX 78750

City, State and Zip Code

COMMENTS: PROPOSED PLAN FOR REMEDIATION OF THE 300-FF-1, 300-FF-1 and 300-FF-5

I commend the work that went into preparing the alternatives however from a taxpayers perspective I think that they are too expensive for the benefits achieved. I realize that the alternatives have been boxed in by past and on going decisions such as achieving DWS. I find this permeates most of the work at Hanford. Unrealistic goals and requirements are set and agreed upon and then dictate the actual measures on the ground.

At the present I would like to see an alternative that only calls for MNA and ICs. The risks appear to be small of any significant contamination beyond the 300 area and continued safeguards within the 300 area would be sufficient.

Bill Johns
12608 s scribner road
cheney, Washington 99004

September 16, 2013

Mr. Matthew McCormick
U.S. Department of Energy
P.O. Box 550
A7-75
Richland, WA 99354

via email: 300AreaPP@rl.gov

Clean Up Hanford's Toxic Pollution!

Dear Mr. McCormick:

I support the removal, treatment and disposal of radioactive and toxic pollution from the Hanford Nuclear Site, beginning with pollution in the forty square miles where uranium was processed into fuel rods, the "300 Area." I support a plan that continues to remove the uranium and other contaminants, prevents further groundwater contamination, and protects future generations from ongoing pollution.

I am concerned that Energy's proposed cleanup plan for the 300 Area will leave too much uranium and other toxic pollution in the ground. The proposed plan bets on experimental technology to bind uranium to the soil. If this does not work, uranium will slowly contaminate the groundwater and flow to the Columbia River. This "do nothing" plan does not adequately protect the human health and the environment, including endangered salmon that spawn in the Hanford Reach of the Columbia River, and those who live, recreate and fish in the Hanford Reach.

I am also concerned that Hanford cleanup is dictated by a core assumption about how future generations will use this site. Energy's reliance on an industrial standard defies reasonable assumptions of future use and allows Energy to get away with less cleanup.

Specifically, I urge Energy to:

- evaluate a broader range of alternatives, particularly ones that involve digging up the most highly contaminated soil;
- develop a "Plan B" to ensure the government deals with uranium pollution if experimental polyphosphate injections prove ineffective;
- uses a more protective standard to ensure cleanup protects future generations that use the site for drinking water, fishing, farming, and outdoor recreation.

Thank you for the opportunity to comment about the proposed cleanup plan and Hanford's affect on the Columbia River and river communities.

Sincerely,

First Name	Last Name	Email	Zip	State	Comment
Leah	Aleck	mysticonealeck@yahoo.com	98948	WA	Hanford is ancestral lands of Wanapum/Yakama. When taken for war efforts, Atomic energy,said it was temporary. Now it the most contaminated site. Am I able to return and swim,, fish, collect my native & medicinal plants? Are the safe to eat?
Joshua	Alfsen	josh.alfsen@gmail.com	97213	OR	
Pamela	Allee	alleepa@gmail.com	97203	OR	Hanford's legacy is a continuing shame on us.
Winston	Anderson	wh_anderson@msn.com			
Janet M.	Anderson	Heyheyja@me.com	93446	CA	My family is there, my family is here, keepers of the earth.
Barbara	Antonoplos	barbara.a369@gmail.com		GA	
Susan	Applegate	susapple@centurytel.net	97499	OR	The pollution arising out of the Hanford Nuclear plant has been a struggle for too many years. It is time to clean it up. With underground water systems being contaminated, it is totally apparent that it needs attention to stem even worse consequences.
Jon	Arakaki	Jon.arakaki@oneonta.edu	13820	NY	
Catherine	Arp	crzangar@yahoo.com	97212	OR	Clean up means clean up!!! I have family in Richland, swim there often as do they, and also enjoy the river in many other downstream locations. Even if I didn't, it grieves me to think wildlife and humans could be exposed to Energy's mess more than they are already. It's wrong to pollute our waters, and are government should be enforcing cleanup, not excusing the mess.
Edward	Averill	eda@acm.org	97008	OR	
Leslie	Avery	Insindiary1@aol.com	55391	MN	This impacts Us all and will impact My future generations, fix it.
Ruth	Berkowitz	ruthowitz@gmail.com	97031	OR	Thank you for your work thus far. Please do a noble job and get rid of the contaminants properly. We need clean water for all -
Reverend Riki	Berlin	rikiberlin@yahoo.com		CA	Columbia River is my destination of choice for fishing holidays. I like to go there every year and depend on the health of the river for all my activities. I also recommend others go there for wineries, wedding destinations and especially to enjoy the swimming and windsurfing at some of the beaches. I especially like the Skamania Lodge for conferences and vacations, based on it's proximity to the river and all the activities there. There are concerts by the water and one of my absolute favorite meals is Salmon. We need you to evaluate a broader range of alternatives to rid this SuperFund Site of it's radiation. It's a sin against nature to leave this mess. Please, I urge you, as a steward of your state, to do the right thing for all of us, the people, the animals and the natural beauty of your waterways and clean it up!

First Name	Last Name	Email	Zip	State	Comment
LynMarie	Berntson	rbernt@earthlink.net	55346	MN	What we contaminate today cannot be cleaned up tomorrow, or ever! Save the river, the salmon, and wildlife for our children. They don't deserve to suffer health from this tragic and shortsighted environmental degradation.
Sarah	Bice	sfsbice@yahoo.com	97202	OR	I live in Portland, Oregon, downstream from Hanford and the DOE needs to prevent Radioactive waste from further Radiation entering the soil and river. DOE is primarily responsible for nuclear waste cleanup. We depend on it.
Angela	Bischoff	angela@cleanairalliance.org	M6J	0A7 ON	
Nancy	Black	nancy@mercurypress.com		CA	
Lee	Blackburn	leeblackburn@live.com			
LARRY	BRANDT	nwlarryb@yahoo.com	98612	WA	
rv	branham	gobq@yahoo.com	97211	OR	
Sandra	Brewer	sandrawow@gmx.com	98668	WA	THIS RIVER IS SUCH A MULTI-USE AND SCENIC RIVER. I WANT THAT TO BE RETAINED AND PRESERVED FOR ME, MY FAMILY, MY FELLOW CITIZENS! CLEAN THIS UP PLEASE!!!
Susan	Brickey	sab97206@comcast.net	97206	OR	I grew up in the Hanford area and saw how the professionals affiliated with it positively impacted our community. I saw families stabilized because of the jobs it offered then. But it's potential for all of us now, who live downriver is horrendous. We must get it cleaned up.
Ann	Brooking	brookingann@yahoo.com	98232	WA	
Susan	Brown	SusanStopit@gmail.com	91942	CA	
philip	brunner	pdbrunner@gmail.com	97217	OR	
Alison and John Bryan		alisonb@gorge.net	97-31	OR	We live by and recreate in the Columbia River!
Thomas	Buchanan	clrtom@earthlink.net	98117	WA	The 618-11 Burial Site, a so-called "hot Spot" in the 300 area-in fact right underneath the western parking lot of the Columbia Generating Station nuclear plant- s not included as a priority in the 300 area clean up plan, yet it is closer to the Columbia, and is a burial dump which has plumes of tritium and toxic chemicals leaking out of the dump as I write. This is no time to wait, stall or mis-characterize and ignore these dangerous sites so close to the Columbia. US DOE, ACT NOW!
Helga	Burkhardt	muttskibu@gmail.com	98672	WA	
Kelly	Campbell	kellyjcampbell@gmail.com	97214	OR	
Carol and George	Carver-Exum	river4mama@yahoo.com	98612	WA	
Janice	Castle	jancastle@comcast.net	97034	OR	

First Name	Last Name	Email	Zip	State	Comment
Doris	Cellarius	doris@cellarius.org		AZ	Most of my family live in Portland Oregon, downstream from Hanford. Please do not leave all that uranium and other toxic pollution in the ground. I care very much about everyone impacted by this terrible toxic site. Please use a more protective standard.
Heather	Chapin	Heatherchapin@comcast.net	97217	OR	
Robin	Chapman	nocanoaa@gmail.com			
Elaine	Clary	laelclar@hughes.net	12926	NY	It's time to stop playing Russian Roulette with our finite natural resources and be responsible for the human garbage we are creating. The cavalier attitude of experimenting with an unproven method of waste disposal and then if THAT doesn't work, shrugging your collective shoulders is an eight year olds irresponsible attitude unbecoming Scientists. You know very well, as does the average citizen, that the life of these radioactive chemicals will damage the water and land they come into contact with for centuries to come. It's time the nuclear producing industry take the responsible high road and lead the way in being proper Stewards of our environment.
fritzi	cohen	nahcotta2@aol.com	98637	WA	Radiation from the Columbia travels through the tides and has been reported in Willapa Bay, Washington. The need to clean all of this up is even more critical because of the anticipated impact of Fukushima on the Washington and Oregon coasts.
Barbara	Council	barbaracncl@yahoo.com	97201	OR	The "Mighty Columbia" and all of our water is what sustains all creatures. Polluting it with toxins is horribly irresponsible. Lets take care of our rivers not pollute them. Thank you
LeAnn	Craddock	leann.craddock@sbcglobal.net	93304	CA	
Meredith	Crafton	merecrafton@gmail.com	98118	WA	The health of the Columbia River affects the entire pacific northwest. I enjoy recreation on the Columbia River, drink wine and eat produce from the region. A safe and effective cleanup of the Hanford Site is imperative. Please do not shortcut the health and safety of the Pacific Northwest.
LYNDA	CUNNINGHAM	LYNDEEEE@COMCAST.NET	98661	WA	Please...act now. My friends and family live near the river and fish and boat there. Our kids play in this water.
John	D'Avolio	johnd@triggerfish.org	97212	OR	
Rose	Dallal	searosed@gmail.com	94602	CA	My grandchildren live next to the Columbia River. I want their environment to be safe and the river's waters to be clean and usable, without pollution from Hanford.
Charlene	Damitio	islandchar101@yahoo.com	98503	WA	
Karen	Damyanovich	karenrue@gorge.net	98672	WA	
Donna	Daniel	nonnamax@gmail.com	97203	OR	

First Name	Last Name	Email	Zip	State	Comment
Ralph	Davis	ralph@actionvideonw.com	97056	OR	I am not certain that leaving toxics to slowly decay - in place is good policy. Especially radioactive toxics.
Desdra	Dawning	desdradawning@yahoo.com	98502	WA	
Carl	Dominey	carldominey1943@gmail.com	97103	OR	
james	Donaldson	jamesd@glorietaschool.org	98856	WA	Mr. McCormick, Please know that as one who lives along one of the tributaries of The Columbia, our work to restore salmon habitat will be enhanced by your cleanup work.
mickaelle	Dougherty	drmickaelledougherty@gmail.com	10013	NY	
Patt	Doyle	patt@olypen.com	98622	WA	
Joseph M.	Dunford	joe.s.feeds@gmail.com	97220	OR	
Mary	Duvall	rover@clatskanie.com	97016	OR	I live quite near the Columbia River; the towns that supply my services and resources are on the Columbia. The fish I eat come from the Columbia. Not that any of that matters. A radioactive Columbia is insane; Hanford must be addressed. Containment is essential and if there can be a way to detoxify the mess up there, we must find that way.
Emily	Eisen	balance@brainworksplus.com	11768	NY	
Benton	Elliott	benton.elliott@gmail.com	97401	OR	
Ashley	Erdely	erdely.ashley@gmail.com	98672	WA	Please, please, please help keep uranium out of the Columbia River.
Rowan	Everard	wax.delerium@gmail.com	97217	OR	I swim and kayak in it, and I do not want to worry about radiation!
Jane	Feldman	feldman.jane@gmail.com	89108	NV	DoE's role is to protect people and the environment, not to let wealthy corporations skate from the pollution they have created. - Please make sure the Columbia River is protected. - Thank you.
Laura	Feldman	lfeldman32101@yahoo.com	97217	OR	Don't make it - Don't bury it - And don't forget about it! - - Plan B - - Future generations
Dennis	Fisher	kmwifish@gmai.com	97470	OR	The adults that created the mess should clean it up! There is no justification to waiting any longer - to see how it works out-
Shauna	Flanigan	Smcflani@gmail.com	97219	OR	
edgar	freud	elfreud@aol.com	10023	NY	we eat your fish, take care
michael	gaskill	moneyglass@gmail.com	97217	OR	The Columbia River is the lifeblood of the Pacific Northwest. I was born and raised in Oregon, and I am appalled by the failure to protect one of our greatest resources and treasures. I swim, fish, kayak, and canoe in the river. Get this cleanup done right!
Leonidas	Giakoumakis	lgiakoumakis@hotmail.com	98074	WA	My family spends our a good part of our summers on the water at the Columbia River. We are greatly concerned about the possibility of nuclear waste leaking into the river.

First Name	Last Name	Email	Zip	State	Comment
Collin	Godkin	collin@thegodkins.com	97031	OR	My whole family and all of my friends use the columbia river in one way or another. It is large reason why so many of us live in the gorge. Please do the right thing and remove any and all possibility of future contamination. - thank you - Collin Godkin
Michelle	goldfeder	riseupnabha@gmail.com	97530	OR	I recreate and eat fish out of the Columbia. I pay taxes and the impact of Hanford on the health of Oregonians impacts how my tax dollars are spent. Remediation work will also be more costly the longer the pollution continues. I am concerned that the clean up has taken so long and what damages are unknown. Clean up Hanford now and to the fullest extent available including digging out the contaminated soil. Thank you, Michelle Goldfeder
Roxanne	Gonzalez	ghostdog4145@gmail.com	87507	NM	
Linda	Green	green.linda16@yahoo.com	97756	OR	I grew up near the Columbia and spent many days waterskiing and swimming. My brothers still fish the river. Please keep it clean for my nieces and nephews. Thank you.
Andrew	Grossman	andrew_grossman@hotmail.com	98648	WA	I swim in the Columbia almost every day in summer. In the spirit of the Clean Water Act, I urge that you remove contaminated materials from the landfills of Hanford.
Stephen	Grove	wphistorian@aol.com	12553	NY	
Mimi	Gunderson	mimi.gunderson@gmail.com	97031	OR	
William	Gupton	wmgupton@aol.com	28211	NC	
Patrick	Haley	path@gorge.net	98672	WA	
Ardyth	Hallicola	twostarsdancing@live.com	97347	OR	
Charles	Hansen	7240@comcast.net	98632	WA	Hanford should be cleansed properly. If that cost brings us to our knees, financially, we need to be honest about it, not push the ill-health on downriver lives instead.
Mary	Hanson	hansonmary@hotmail.com	98105	WA	Hanford's ongoing pollution is not just a threat to those who live downriver or who use the Columbia River. I find it callous to not care about the health and well-being of the people and lives in that area, even if I do not live, swim or boat there myself. If Hanford had been located on Puget Sound, I would expect the people of Portland to care.
Beatrice	Harrison	beatriceann@peoplepc.com	77486	TX	I spent half the year in Washington State and I love the Columbia. I love the wildlife diversity, including the birds, fishes, and mammals. The river is such a huge resource for millions of people, too. This radiation will be in the environment forever. Please do your best to clean it up.
Karen	Hensley	hensley.karen@yahoo.com	97213	OR	I have lived on cities on the Columbia almost my entire life. I swim in it, boat on it, fish in it, and consider it the heart of my homeland. I beg you to protect it.

First Name	Last Name	Email	Zip	State	Comment
Hollis	Higgins	treebarkhh@yahoo.com	99205	WA	The ongoing production of radioactive materials at Hanford is cause for alarm since Energy has shown itself paralyzed as to what to do with the waste products. The Fukushima incident has informed us all about the danger of water pollution from nuclear waste; everyone downriver is affected. As Energy continues to poison the planet, responsible citizens require 100% solution to the cleanup problem, and letting waste drain into the Columbia River for thousands of years is unacceptable, irresponsible, lazy and short-sighted. I demand cleanup of this military site NOW!
Derrick	Hindery, Ph.D.	dhindery@uoregon.edu	97405	OR	
Susan	Hoch	susanhoch1@gmail.com	98230	WA	
Peter	Howland	cannon_ball800@yahoo.com	97401	OR	
Susi	Hulbert	susih1313@yahoo.com	98632	WA	
McLaren	Innes	macmailg@gmail.com	97103	OR	I live at the "sink" for the Columbia River, Astoria OR. This vital artery of life needs to be restored to its original well being asap. Dare we eat the fish or water our gardens with this water?
Georg	Jacobs	aranobilis@earthlink.net	97214	OR	The Columbia is one of the nations most important rivers. It is imperative that a clean-up be complete and safe.

First Name	Last Name	Email	Zip	State	Comment
Brian	Johnstone	reiver@nehalem.tel.net	97131	OR	We on the west coast are now caught in a toxic pincers hold between Fukushima's poisonous detritus creeping across the Pacific, devouring all beings in it's path, and Hanford's seeping destruction of the once mighty Columbia River and it's dams that send energy to other states. - The native peoples, who were the most affected and remain likely to be at the forefront of the receiving end of all the folly of "Industrialized" but hardly 'Civilized' nations and their greed-driven research and development of Nuclear energy with it's war-making, potentially life- ending by-products for continued military threats to us all. - Yet all the combined scientific knowledge of the technology has produced only shoddy and unfulfilled, blinkered and head-in-the-sand attitude to the results of continued incompetence, some of it slip-shod, lacking in urgency and wanton, in an already corrupt industry on the behalf of the US government and it's cronies like Bechtel, to whom they pay vast fees of taxpayer's money to remain impotent in the solution to the spawn of the Manhattan Project and all it's short and long-term death-dealing consequences. - You owe it to the native peoples, those of us who live down-wind of Hanford and enjoy the former privilege of living on or by one of the great rivers in the USA and the world, to get serious and dedicate yourselves and your subcontractors to a viable and permanent solution to the safe eradication, secure storage and ultimate disposal of the filth of your own creation, for the benefit of coming generations not only of the human beings but all others that live in, on, off and by the Columbia's unique ecosystem.
Karen dennis	Jones king	kkj.jones@gmail.com qubeular@gmail.com	97239	OR OR	stop with the nuclear waste already. one, solar steam w/ reservoir reserves is a much safer bet. two, nuclear waste should be stored in places away from water supplies and in areas of massive photon bombardment, in case of the undeniable leaks budget cuts are guaranteed to make happen.
George j.	Koch koester	terrykoch1@yahoo.com jk@janelledesigns.com	95051	CA OR	I windsurf on the Columbia, so I am IN the water and often accidentally swallowing water sometimes when I take a fall. I also eat fish from the Columbia River regularly.
Andrea Marilyn	Kopecky Krause	kopeckyal@hotmail.com ruddak@comcast.net	97219	CA OR	Please consider all your actions, very carefully. Not just for us, but for our children but for their children and those who follow them.
Laura	Kreger	laura.kreger@gmail.com	97214	OR	

First Name	Last Name	Email	Zip	State	Comment
Kathy	Krisinski	oceanchildkr@yahoo.com	97266	OR	
Carol	Kurz	carolkurz@comcast.net	60201	IL	
Theresa	Labriola	theresa@columbiariverkeeper.org			
Theresa	Labriola	tlabriola@icloud.com	97040	OR	
Theresa	Labriola	tlabriola@gmail.com	97040	OR	
Rhett	Lawrence	rhettlawrence@yahoo.com	97217	OR	
matt	lewis	mattlewis5@hotmail.com	97209	OR	
Rebecca	Lexa	whishthound@gmail.com	97232	OR	
Judith	Lienhard	lienjud@aol.com	97225	OR	
Judith K	Litt	jdklitt@spiritone.com		OR	
Thomas	Llewellyn	tomisclever@gmail.com	94516	CA	
Mary	Lyons	marylyonsnow@comcast.net	98632	WA	
David	MacNally	dmacnally@gorge.net	98672	WA	
Barbara	Mahoney	mahoneyb25@yahoo.com			
Lloyd	Marbet	lloyd@marbet.org	97009	OR	
Mitchell	Maricque	mmaricque@yahoo.com	53202	WI	
Carolyn	Martin	carolyn.martin.mail@gmail.com	97205	OR	
Marla	Mason	lexisgran@live.com	98292	WA	I do not want my children and grandchildren, my friends, any living being exposed the the toxic mess that Hanford possesses. This never should have happened now it needs to be fixed before we all become ill.
Nancy	Matela	nmatela@pacifier.com	97215	OR	I believe the increasing leakage of radioactive waste at Hanford is causing fatal birth defects at an unprecedented rate. There are many other side effects but this appears to be the most serious.
Nancy	Metrick	nancymetrick@msn.com	97202	OR	
NANCY	MORRIS	ncm@w-link.net	98160	WA	Hanford needs to be dealt with using the same intensity of resources that we used to put a man on the moon. For heavens sakes, an entire state and bordering state and all its people and natural resources are at stake. We can not delay and stall any longer. No longer can our political system justify short changing the funds needed for cleanup and containment.
Doug	Morton	dugmorton@charter.net	99362	WA	Do something besides spend money like it's not yours.Oops, I guess that is the case. Too bad lives are at stake here.
PHILLIP	MOYLE	pmoyle6000@aol.com	99208	WA	I HAVE OFTEN FISHED, HIKES, & RECREATED IN THE COLUMBIA RIVER. THE SLOW BUT INEVITABLE MIGRATION OF DANGEROUS CONTAMINANTS TO AND DOWN THE RIVER SYSTEM WILL RUIN THE ENVIRONMENT AND RESTRICT OR TERMINATE SUCH USES.

First Name	Last Name	Email	Zip	State	Comment
Tom	Nadal	tnadal@me.com	98660	WA	I kayak and swim and enjoy eating salmon.
Marianne	Nelson	manelson316@yahoo.com	97202	OR	
mary	neptune	seagoddess75@hotmail.com	98683	WA	
Bonnie	New	bnew1@live.com	97031	OR	
Greg	Norman	normgr00@yahoo.com	97405	OR	
Mark	Othoudt	theo.thoudt@yahoo.com	49262	MI	
Carol	Panfilio	madyapan@yahoo.com	98668	WA	For decades I and others have ask for this clean-up and only get a version of the truth. This is as serious to us in the Pacific Northwest as Fukushima is to Japan and only getting worse. Develop a "plan B" to ensure the government deals correctly with the uranium pollution if experimental poly-phosphate injections prove ineffective. - - It seems that so much experimentation is being done with out really understanding the consequences.
Lorette	Paquin	tintanya2@hotmail.com		Vog 2jo BC	We can no longer tolerate degradation and pollution of the Columbia River by contaminated leakage at the Hanford site. The history of failed assurances of containment are not acceptable. Preservation and restoration of the Columbia watershed depends on a more protective standard for clean up.
Lewis	Patrie	patrie.wncpsr@main.nc.us	28805	NC	
Randi	Perkins	randi.perkins@charter.net	93422	CA	
Nancy	Perry	moonbeam54@me.com	3458	NH	
Corina	Psarrou-Rae	corina_ps@yahoo.ca	l3c5e1	ON	
Barbara	Quinn	barbaraqnn718@gmail.com	97203	OR	
Stephen	Quirke	stephen.quirke@ncf.edu	97232	OR	I use the Columbia to swim, boat, and eat salmon. I do not approve of any plan that allows DOE to sit back while contamination occurs.
Margaret	Rader	holmfarm@aol.com	98579	WA	The Columbia is one of the great treasures of our Country providing water for fishing, recreation and irrigation to keep our crops coming. To permanently ruin this river will have many years of devastation of our food supply, the grains and fish, and the beauty to be enjoyed by all. Our children and grand children will never forgive us for despoiling the Columbia River wonderland.
Dorli	Rainey	dorlirainey@gmail.com	98119	WA	
Ben	Rall	hotleadenema@riseup.net	99205	WA	
Pat	Rasmussen	patr@crcwnet.com	98508	WA	
Linda	Reedijk	greengirlpdx@yahoo.com	97239	OR	
Mike & Jane	Rees	mgrees@comcast.net	98199	WA	

First Name	Last Name	Email	Zip	State	Comment
Laura	Rhoades	rhoadeslaura333@yahoo.com	79084	TX	We already know from our past mistakes. Clean up the pollution. All life depends on it.
Dell	Rhodes	rhodes@reed.edu	98672	WA	I swim in the Columbia River and I eat fish caught in the Columbia. I believe that nuclear power should, in principle, be a part of our approach to meeting our energy needs. But the mismanagement and multiple failures of the Hanford clean-up provide clear evidence that we're not yet prepared to develop and use nuclear power safely.
Alan	Richards	aramnas2@yahoo.com	98638	WA	We and our children and grandchildren want to continue using the Columbia River, along with thousands of other people, every year. Uranium and its cohorts have a half-life of radioactivity more than 100,000 years! Think long-term!
Lani	Roberts	lanirob@gmail.com	97031	OR	By leaving the residual radioactive and toxic pollution, including uranium, tritium and heavy metals in the ground, will slowly decay or dilute into the Columbia River. There are families, farmers, and much more that this will have a very negative effect on. Please be responsible to long term effects on nature and our health.
ar	Rochlin	rochlin2@comcast.net	97231	OR	
donna	roddvik	droddvik@gmail.com	97031	OR	
claudia	Ross-Kuhn	claudiark@comcast.net			
Tamiko	Ruhlen	ruhlen@gorge.net	97031	OR	
Cindy	Ryu	cindy4shoreline@yahoo.com	98133	WA	
Jason	Salmi Klotz	jasonsalmiklotz@gmail.com	98604	WA	
Catherine	Schiedler	catherineschied@juno.com	97215	OR	
Charles	Schweigert	schweigertstudio@yahoo.com	97103	OR	
Kelly	Scott	kellydoc1@comcast.net	97205	OR	
Kathrin	Sears	sears.k@gmail.com	97031	OR	
Linda	Seeley	lindaseeley@gmail.com		CA	
Vladimir	Sergeyev	northface0912@gmail.com	98052	WA	I'm a windsurfer and visit Columbia River Gorge for windsurfing with the family (including our son) about every other week in the summer. The quality of the water in the Columbia River is already of great concern and adding radioactive pollution to it does not help in any way. Please help us keep the river clean: it's a gift of Nature that we must appreciate. No budget cuts can justify letting radioactive poison leak into a major river that thousands of people use every year.
Linda	Serres	lseight2@aol.com	97045	OR	
Yoko	Silk	yokita@gmail.com	97211	OR	

First Name	Last Name	Email	Zip	State	Comment
dorethea	Simone	light1lamp@gmail.com	98607	WA	We have no right to leave all the pollution that corporations want to leave, just so they can stay in denial or that money addictions in place can continue. You want to sell out our children just for money? Too sick!The Gorge is not "D' Nile!"
Caroline	Skinner	caro4321@earthlink.net			Come on! We can't allow radiation into the Colombia River-it would be a public health disaster. Please keep us safe! Don't mess this up!
Dawn	Smallman	velvethammer00@hotmail.com			
Brenda	Smith	brendaandlarry@me.com	97203	OR	
Carolyn	Smith	cmkerf@seasurf.net	97146	OR	
Annaika	Sol	annaikasol@gmail.com	94117	CA	
Laura	Sorensen	lsredoak@gmail.com			
ruth	spetter	rspetter@aol.com	97219	OR	The rivers and the woods - all the places around us are our home - we must not destroy our home or we will have nowhere to go. Clean it up. You must. Thank you.
robert	stabbert	robert@stabbert.org	97219	OR	I will no longer eat fish that has been in the river.
Robert	Stang	livearth1@aol.com	97103	OR	
Kathleen	Stebbins	stebbins.kathleen@gmail.com	98672	WA	
Monique	Stenger	msteng01@villanova.edu	97031	OR	As a public health nurse, I am not not only concerned about the environmental implications that is involved with not adequately removing the uranium from Hanford (such as increased cancer rates and liver disease but also uranium being deposited in human bones) for people near Hanford but also for everyone who lives and vacations along the Columbia River. Right now the Columbia River Gorge is an idealized vacation spot that people come because of the beauty but I believe if the uranium is not cleaned up properly the Gorge's positive reputation will change to a negative one. Already this summer in Hood River, a lot of the wind surfers and kite boarders are starting to complain of a cough after being in the water for a long time. I think it is imperative that the clean up be done thoroughly and with methods that are known to remove uranium.
Kevin	Stewart	Kevin@talesoftheemeraldtriangle.com			
Rev. Vicky	Stifter	vstifter@gorge.net	97031	OR	I am a concerned mother of two children & we live on the river. It is a source of life for many in our community.
Jenny	Stoffel	jenny.stoffel@gmail.com	97034	OR	I swim in the Columbia River!
Deon	Strain	deonstrain@aol.com			
Roger	Strong	raven98337@yahoo.com	98310	WA	We want this, and we wanted it done yesterday.. Why is this being treated in such a slow manner?

First Name	Last Name	Email	Zip	State	Comment
Daniel	Swink	drswink@pacifier.com	98666	WA	I live downstream from Hanford and I do not want my health or the health of others, or the environment we all depend on to be jeopardized by any irresponsible clean-up at Hanford.
Diana	Talcott	diana.talcott@gmail.com	97214	OR	Please think of the terrible effects occurring in Fukushima, Japan. Hanford Waste will be 10,000 times more terrible for all living things. Many of us will have to move out of our beautiful Northwest Lands. Forget the money and do what's right and safe. Do it gradually and carefully not via a perceived economic emergency - plan. Please, Please, Please.... - Blessings, - Raymond Tarpey
Raymond	Tarpey	raymontarpey@yahoo.com	97034	OR	
Mason	Taylor	Masontlr25@gmail.com	98125	WA	Trying to make do with the cheapest 'solution' is not at all fair to those of us who depend on Columbia River. "Natural attenuation" is totally unsatisfactory. This nuclear waste MUST be properly disposed of.
Jay	Thiemeyer	jaythiemeyer@yahoo.com	97203	OR	
Mark	Thormahlen	mthor@mindspring.com	92026	CA	The pollution at Hanford will impact everyone in Washington and Oregon and the coasts of those states.
Linda	Thorson	dalin42@me.com	98115	WA	
Christine	Tolotti	gorgeraptors@gmail.com	98605	WA	Our entire family recreates in the Columbia River and we eat fish several times a week - caught in the Columbia. We want to see something done to clean up the Hanford waste that will not affect our lifestyle! Please!
Penelope	Treat	ptreat@centurytel.net	98631	WA	We live on the Long Beach Peninsula and we eat - the fish from this river once a week. We strongly - encourage you to protect this river from toxins that will impact our economy (no one knowingly will eat Columbia River fish with toxins in their tissues) nor will they want to fish these waters or - drink the water. Let us not go down the "too late" - road of the Japanese and loose the respect of it's - citizens.
Ellen	Tricher	ellent3@yahoo.com	97031	OR	Even though I live in Michigan, I am affected when any river or body of water is misused and polluted. We are all citizens of the earth and desperately need to keep the waters on our planet clean and usable.
Carol	Van Strum	cvs@peak.org	97390	OR	
Sandra	VandenHeuvel	sandravan1145@gmail.com	49441	MI	
Judy	VanderMaten	vanho@centurytel.net	98612	WA	This is why we are all getting cancer.
Mary	Variola	maryvariola@gmail.com	6043	IL	
Heather	von Rohr	vonrohr@gmail.com	11220	NY	
Amanda	Wagner	amandawagner81@aol.com			
Mickey	Weaver	micksmedia@comcast.net	97267	OR	

First Name	Last Name	Email	Zip	State	Comment
Robert	Weinman	weinmanr@gmail.com	97031	OR	There is too much at stake to do anything less than the very best at the Hanford site. To use unproven techniques w no long term case studies while jeopardizing the millions that live downriver over many generations would be irresponsible and would only pass the cost and danger on to future generations. Please do it right.
Evelyn	Weinman	islandchamorrta@yahoo.com	97031	OR	
Larry	Wenberg	larrywenberg@yahoo.com	96814	HI	
Lynn	Weyand	laweyand@gorge.net	98651	WA	I live on the WA. state border across from Hood River. I used to swim in the river 20 years ago, but REFUSE now. I have seen folks with cuts that don't heal, who are in the waters. The Hanford site needs serious cleaning up.
Robert	Whitbeck	Bob_whitbeck@yahoo.com	98027	WA	
Julie	Wiesner	juliewiesner@comcast.net	98685	WA	
kim	wilbur	kmwifish@gmail.com	97470	OR	
Sherry	Willoughby	shughesy@msn.com	97223	OR	
Thomas	Wilson	wilson.thomas22@gmail.com		OR	We have to remember to think about long term consequences of radiation leaking into the Columbia.
Barbara	Wilson	wilson0752@comcast.net	97008	OR	I use the Columbia River for boating, swimming, fishing, and for birdwatching. Hanford's ongoing pollution problems poison the river and must be stopped before the pollution kills all life in the river.
Alan	Winter	alanyehudah@gmail.com	97211	OR	
Joseph	Winters	jbwinters@me.com	98847	WA	
Lawrence	Woelfer	lwwoelfer@yahoo.com	97201	OR	Lack of proper and adequate cleanup is endangering the livability for future generations in the NW.
Rebecca	Wolfe	rr.wolfe@comcast.net	998020	WA	This environmental degradation has gone on for far too long. I lived downwind from Hanford in Oregon for twelve years. My three children were all born there and grew up there. I hope and pray that we will not be among the cancer victims of Hanford and I urge your support for best management practices for the Hanford cleanup. This should be a top priority.
John and Polly	Wood	machjuan@yahoo.com	97031	OR	
Pam	Wood	pamarama2@yahoo.com	97211	OR	As Japan's Fukushima disaster reminds us, there is no such thing as "away". We cannot continue to invest in energy methods which enganger the health and well-being of our grandchildren, even their grandchildren, as well as the lands and waters on which they will depend.
Steven	Woolpert	swoolpert@cwcmh.org	98635	WA	

First Name	Last Name	Email	Zip	State	Comment
Gillian	Young	leoni1620@live.co.uk	IV10	8UZ	We have one body of water that is circular in motion, river joins the sea clouds absorb the water from the sea, the water homes many species some yet undiscovered that are not land dwellers this is their world if they had a voice they would not allow this to happen, you are contaminating a life force that isn't a commodity it is God given for every species, the earth needs the water, our planet that we were sent to to grace not to destroy or contaminate, we are souls living in a vessel no matter what species of animal, we need water to survive!
mitchell	zand	kingtut3474@gmail.com	97071	OR	My Family and I swim and fish in the Columbia River we would appreciate it if you could clean up the nuclear site so my grand kids can enjoy the River in the future
Susan	Zimmerman	sweetwater3471@gmail.com	97737	OR	

From: Carol Wilson <cwilson894@comcast.net>
Sent: Monday, July 29, 2013 9:39 PM
To: ^300 Area Proposed Plan
Subject: Kim Ballinger, USDOE re: Hanford nuclear wastes

Attention: Kim Ballinger, USDOE

Hanford is the most contaminated nuclear site in the western world. For 70 years, Hanford has been releasing radioactive contaminants into the water, air and soil posing serious health and environmental threats. It's been a hazard ever since it was developed at this ill-conceived location. It's a threat to all living things that come in contact with its radioactive soil, or live down-wind or down-river. Plans to clean up the wastes began as early as 1958 after the first leaks were discovered. Don't kick this can down the road any longer. **Get 'er done!**

I'd suggest the \$billions in government subsidies that have been going to the planet's major polluters be diverted to this clean up effort.

If ever there was an argument for a strong and well-funded EPA, this is it.

Sincerely,

Carol Wilson
3512 Ashley Dr NE
Olympia, WA 98506

cc: Maria Cantwell, Patty Murry, Dennis Heck, Adam Smith, Jamie Herrera-Butler

From: Fasnacht <fasnacht@comcast.net>
Sent: Monday, July 29, 2013 5:58 PM
To: ^300 Area Proposed Plan
Subject: Fw: Hanford area 300 Cleanup & Public Comment Period

One more try.

From: [Fasnacht](#)
Sent: Monday, July 29, 2013 5:51 PM
To: 00areapp@rl.gov
Cc: [Becker Sen. Randi](#) ; [Bellon Maia](#) ; [Brown Madeleine \(ECY\)](#) ; [Cantwell Maria](#) ; [Denny Heck for Congress](#) ; [Heart of America Northwest](#) ; [Karen Bowen](#) ; [MacEwen Rep. Drew](#) ; [Pollet Jerry](#) ; [Reykdal Chris](#) ; [Swecker Sen. Dan](#) ; [Charleen Goodrich](#)
Subject: Hanford area 300 Cleanup & Public Comment Period

Attn: Kim Ballinger,

Re: Hanford area 300 cleanup & Public meetings this week and next. I am unable to attend and am submitting my comments via email.

USDOE has failed. The US Congress has failed. How? That Nuclear Waste crap is now IN THE COLUMBIA RIVER BECAUSE YOUR PROMISES OVER THE LAST 50-40-30-20 YEARS HAVEN'T BEEN KEPT! Common sense says that crap will pollute the entire river corridor between Washington and Oregon AND THE WEST COAST – AND – ALL THE PEOPLE, FISH, AND ANIMALS that/who drink the water.

Don't give me the sob story about no money! Get that contaminated soil, and those leaking tanks, and all the nuclear waste being stored at Hanford AND MOVE IT TO HIGH GROUND, where there is no likelihood of a volcanic eruption. Then, FIND THE MONEY TO INVEST IN RESEARCH TO EITHER NEUTRALIZE THIS CRAP, OR SEND IT TO THE SUN.

ALSO, STOP CONSTRUCTING POWER PLANTS AND WEAPONS THAT CREATE NUCLEAR WASTE WE CAN'T DISPOSE OF!
AND DO IT NOW!

Respectfully yours (Although I am totally disgusted and alarmed!)

Sharon Fasnacht, Mediator, Guardian Ad Litem
Confidential Dispute Resolution
4006 113th Avenue SW
Olympia, WA 98512
(360) 753 8009

PS THIS IS NOT MEDIABLE!

From: Teresa Holt <tjholt2@frontier.com>
Sent: Monday, July 29, 2013 11:19 PM
To: ^300 Area Proposed Plan
Subject: Hanford Cleanup comment

Dear Kim Ballinger,

I am writing to request that Hanford be cleaned up within the next two years to levels safe for children, unrestricted future public uses and exercise of treaty rights in accordance with Washington's state cleanup law (MTCA). My mother's college roommate grew up in Richland and died at an early age of cancer caused by exposure to the Hanford plant. She left three young boys motherless and her husband died not long afterward. I am writing to implore you not to become an accessory to murder if you allow this scenario to repeat because of your inaction. The answer is simple enough for children to understand – clean up your own mess.

Since 300 Area is no longer 'industrial' it should not be cleaned up to the less stringent 'industrial' standard. Many people already use this area for recreation. Future residential use is probable. A 'Love Canal' level of dangerous exposure would cost Washington state millions of dollars in the future. Let's fix it correctly the first time. Additionally, we should honor the treaty rights that require cleaning up to levels safe for Native Americans to use the shorelines and River corridor.

Twenty-two years is too long to wait for groundwater to be cleaned up to safe levels along the Columbia River. How many people will be endangered in that time? When the area is designated as the southern gateway to the Hanford Reach National Monument and is so heavily contaminated, it begs the question "Monument of what?" How the US Federal Government flaunts its own laws and disregards its citizens?

I request and encourage the removal of contamination in soil above the groundwater. Please reject the "monitored natural attenuation" and "enhanced natural attenuation" proposals. Watching to see how bad the contamination can get and how many people will be hurt is not a 'remedy', it is simply observing carnage. State and federal cleanup laws require the use of "permanent remedies", which is the removal, treatment and disposal of contaminated soil, particularly uranium, cesium, strontium, PCBs and TCE. Thirty to forty feet is a reasonable request to remove the uranium and other contamination which USDOE dumped into the groundwater.

Please, please don't reward USDOE for its continued pollution of soil and groundwater for decades after it was explicitly illegal. Kindergarteners can understand the principle that rewarding bad behavior is not 'fair'.

As a mother, I request that USDOE follow state cleanup law and cleanup to a level which protects our children and future generations from cancer risks greater than 1 additional cancer for every 100,000 children who will be exposed to the soil, groundwater, contaminated fish and plants. How far will the contamination spread when crops and fish are transported for sale? The 15 millirem radiation dose proposed does not even meet the EPA's Superfund requirement! Pardon me, but as my children would say "Are you kidding me?" To meet the standard, the cleanup levels need to seek to reduce exposures to 2millirem per year from ALL combined carcinogens. Please take note of the 2006 the National Academy of Sciences updated risk estimates for radiation exposures, in a report which is supposed to be the basis of revised standards. However, neither EPA, USDOE or WA State have updated their risk estimates. Under the BEIR VII best national consensus estimates of risk, 15 millirem of exposure would be projected to cause 8 additional cancers per ten thousand exposed people in the general public. Women are 60% more susceptible to get cancer from the same exposure, and children even more susceptible. Washington State's cleanup law requires protecting the most sensitive population with the reasonable maximum foreseeable exposure. For the 300 Areas this would be Native American children exercising treaty rights along the River. It almost sounds like the US government is handing out small pox infected blankets to Native Americans again.

Please do not rely on the unproven technology of injecting phosphate to hold Uranium in place instead of removing the Uranium. It is not a verifiable remedy. It is an experiment.

Please act as a model for our nation's children and clean up your own mess.

Sincerely,
Teresa Jolly Holt
Edmonds, WA

From: Martin Bensky <mbensky@msn.com>
Sent: Tuesday, July 30, 2013 8:29 AM
To: ^300 Area Proposed Plan
Subject: Groundwater Plan

DOE has the models and characterization data suitable for a credible risk assessment for any cleanup options proposed by anyone. It is practically a certainty that even a "no action" decision for many cleanup activities would not have a single harmful outcome for humans, fish or any other fauna or flora for any credible exposure scenario. We American taxpayers demand that our interests prevail over those of anti-nuclear activists who want nuclear waste cleanup and disposal to appear to be an insurmountable problem and those of local politicians and businesses who want our local economy to thrive at the expense of the rest of America even when we don't deserve such extravagant support. DOE has already done analyses that conclude that many cleanup actions in progress exceed the real needs for protecting health and safety; stop hiding those results in ponderous documents, and let the public know the truth.

Martin Bensky
2121 Briarwood Ct.
Richland, WA 99354
(509) 375-1704
mbensky@msn.com

From: Daniel Blunk <daqdann@msn.com>
Sent: Wednesday, July 31, 2013 11:39 AM
To: ^300 Area Proposed Plan
Subject: Hanford Earthquakes

As a resident of the Pacific Northwest, I frequently check for current earthquake activity on the Pacific Northwest Seismic website. Yesterday, Hanford, WA had 10 earthquakes recorded. Since I am not a long-time resident of this state, I had no knowledge of Hanford and the history of nuclear waste and the ensuing clean-up.

Today, there have been 3 more recorded earthquakes. These earthquakes originate pretty shallow in the surrounding basalt, which is fragile at best.

I have tried to contact the Washington River Protection Solutions and The Washington Department of Energy at the Richland Operations Office.

I am praying someone is paying attention to this activity in the Hanford site.

As a final effort, I will attempt to contact someone with the EPA.

Pat Blunk
Vancouver, WA

Sent from Windows Mail

From: Donald Stewart <don.stewart1@hotmail.com>
Sent: Tuesday, July 30, 2013 6:35 PM
To: ^300 Area Proposed Plan
Subject: Thoughts on phosphate application

The questions I would like answered are..

1. What is the risk, cost, if the phosphate application does not work as planned? Does it create another contamination issue or not?
2. In business, as in life, time = money. What is the probability that this solution will be effective, assuming we have a definition of what "effective" is? If the requested study is undertaken, what result would be considered conclusive evidence of success, would a small area be representative of the whole area? how long would the study take and how much will it cost?
3. During the study what additional contamination is going to make it to the river?

My opinion:

If applying the phosphate does not create its own contamination issue, and will not make the situation worse, then the phosphate should be applied. What would we lose if it doesn't work as well as modeled? I'm sure the results of the phosphate application will be studied on a ongoing bases, and if it is not effective, then another approach will be pursued. Again, what have we got to lose by doing something now, except time, money and further contamination.

From: Carol Hiltner <carol.hiltner@gmail.com>
Sent: Wednesday, August 07, 2013 9:51 AM
To: ^300 Area Proposed Plan
Subject: CLEAN UP THE MESS

"No, no," we were all told, "The radioactivity is contained." Well, that is a lie. CLEAN UP THE RADIOACTIVITY AT HANFORD!

--

Best regards,

Carol Hiltner
Author & Artist
206-525-2101
carol.hiltner@gmail.com
www.AltaiMir.org
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From: Sue Johns <prayjohns@hotmail.com>
Sent: Thursday, August 01, 2013 7:43 AM
To: ^300 Area Proposed Plan
Subject: webinar

Thanks for the webinar. It gave me more info than I would have had. I was a little late as I underestimating the time to log on. The only problem was I could not hear all the questions and the mic started to cut in and out. I could hear the presenters OK. Keep trying, someday you will be having a meeting with a bunch of monitors, sort of super skype.

bill johns

From: Greg Kennedy <gregory.a.kennedy@hotmail.com>
Sent: Wednesday, August 07, 2013 10:35 AM
To: ^300 Area Proposed Plan
Subject: Phosphate Injection Program

Dear Ms. Ballinger,

My Name is Greg Kennedy, and I am a 47 year old who earned a Bachelor's Degree in Environmental Science with an emphasis on Policy. I am leading with this factoid due to habitually being asked for my qualifications whenever I get involved with these issues. Additionally, there are service bulletins to my credit with Caterpillar Corp, and Western States Equipment. I'm big on finding solutions that make sense. Last Tuesday I was going to attend the public forum to address this Phosphate injection program. There was a car accident at Rd. 68 that prevented my arrival. Unfortunately my concerns will have to be voiced in this email for now.

It is perfectly understandable how this proposed solution found its way to the table. On one hand we have the fiscal aspect, which we all can get behind, and there is the bureaucratic aspect which on the front side is genius in nature; however I have to ask if the Environment is being fully considered here. I understand the \$1Billion saved by not digging up the substrate, and the reduction in possible airborne contamination. I am well trained in policy, and can see the chain of events by the addition of Phosphate. It will go the RCRA for recombinant chemicals, at which time you can close it out from CERCLA, and then the new pollutant will be considered as part of the Columbia River Watershed pollutant under CWA. On the front side, Brilliant!

Here's the rub; "Why does our only solution involve the addition of a pollutant (pyrophosphate, or organophosphate) that has huge ecological impacts? Are we trying to feed the 2 species of bacterium that can uptake this particular molecule? How much phosphate will have to be injected in hopes that it may combine with a Uranium anion? My best guess is that, because the Uranium is sparsely distributed throughout the soil matrices, there will be a high over saturation of the Phosphate cation. This would have to be the case for this crap shoot of the two constituents to be successful. Mixing them in a beaker is quite different from doing it in solution of varying soil clasts. Imagine for a moment if we find that the resultant Uraniphosphate become very neutrally charged and dislodges from the clasts easier than it did previously. Putting that aside, we still have the original pollutant plus a new one that may become dissociated from each other in the river system. even if the bacteria were to take up these molecules, they have a short lifespan and will break down in the environment quickly. I am a firm believer in offering solutions or not saying anything at all, so here we go.

Have we found any algae that will take up this newly formed Uraniphosphate? If so, maybe the best solution would be to pull the water up from the wells and put it into mitigation pools. In the first pool just simply add the phosphate group at a volume consistent with combination to all Uranium anions in solution, just like the beaker. Then push that water to an alga growth tank where the substrate is kept at a proper level for best algae production, and harvestability. We take that algae and put it in Stainless Steel tanks with the proper bacterium. This will break down the algae, and produce methane, well at least it should. We tap the methane and use it to heat something in the area (building, or who knows). It would be a carbon neutral solution, and it would be a solution that can be closed out from CERCLA. I'm not so naive to not understand that there will be a certain amount of Uranium isotopes that migrate to the river. Truth is, I actually believe that the level now is minimal, when natural sources are considered, but I understand the policy process and know how we got here.

Let me know if I could be of any help here. Maybe we can go over to White Bluffs and get some of the algae out of their spillage system and see if it will take up the new molecule. My phone is 509-432-3786

Keep up the Good Fight,
Greg Kennedy

From: Mike Conlan <mikeconlan@hotmail.com>
Sent: Wednesday, August 07, 2013 10:46 AM
To: ^300 Area Proposed Plan
Subject: re: 300 area cleanup

August 7, 2013

DOE

The latest attempt by DOE to reduce the cleanup at Hanford is NOT acceptable.

The entire complex needs to be rid of radioactivity.

Area 300 is along the Columbia River, and needs to be pristine for the sake of people physically there, and the rest of the planet as the Columbia leaches out radiation from the soil.

DOE being the albatross it is, the most outstanding accomplishment at Hanford – is the enormous amount of wasted effort and expense !!

I've been watching "the progress" at Hanford for decades – what a clusterfuck!!

Stop importing more nuclear waste and replace ALL the single shell tanks.

Mike Conlan
Redmond WA

From: Beth Call <trollshouse@bmi.net>
Sent: Thursday, August 08, 2013 3:07 PM
To: ^300 Area Proposed Plan
Subject: Cleanup of Hanford's 300 Area

The USDOE's plan to clean up the Gateway to the Columbia River's Hanford Reach is woefully inadequate for local tribes and people, including children, using the Hanford reach for fishing and recreation. The plan to supposedly make the area marginally safe for adult workers wearing protective clothing does nothing to protect the tribes who have traditionally fished the area and will now have access only to radioactive carcinogenic fish and water. It does nothing to eliminate the uranium in the Columbia which will be carcinogenic to present recreation users and fishers, and to all future people who will use the river and the basin it drains for thousands of years to come. The USDOE during WWII asked the residents of the Hanford area to take tremendous and unknown risks in defense of our country. Now our country owes them and their descendants the best possible cleanup possible. This is no time to be cheap when so much is at stake for millenia to come.

From: Holmes, Erika (ECY) <EHOL461@ecy.wa.gov>
Sent: Monday, August 12, 2013 9:52 AM
To: Fasnacht
Cc: Brown, Madeleine (ECY); Pollet, Gerry; Dahmen, Lois; ^300 Area Proposed Plan; Bohrmann, Dieter (ECY)
Subject: RE: Public Comment on Hanford Cleanup

Dear Sharon,

Thank you for your comments and concern about Hanford cleanup. I am copying your message to the email address for comments on the 300 Area (300AreaPP@rl.gov), so they will be addressed in the Response to Comments document after the comment period closes.

If you haven't seen it yet, you might check out the Washington Department of Ecology's [Frequently Asked Questions: Leaking underground tanks at Hanford](http://www.ecy.wa.gov/programs/nwp/sections/tankwaste/closure/pages/tank_leak_FAQ.html) web page for more information on that issue.
(http://www.ecy.wa.gov/programs/nwp/sections/tankwaste/closure/pages/tank_leak_FAQ.html)

Our [newsletters about Hanford tanks and treating the waste](https://fortress.wa.gov/ecy/publications/UIPages/PublicationList.aspx?IndexTypeName=Topic&NameValue=HanfordNews&DocumentTypeName=Newsletter) are also a good source of information.
(<https://fortress.wa.gov/ecy/publications/UIPages/PublicationList.aspx?IndexTypeName=Topic&NameValue=HanfordNews&DocumentTypeName=Newsletter>)

Please let me know if you have any questions or further comments.

Sincerely,

Erika Holmes

Community Outreach & Environmental Education, Hanford Nuclear Site
Washington Department of Ecology | Nuclear Waste Program
3100 Port of Benton Blvd. | Richland, WA 99354
Message: (509) 372-7880 | Cell: (509) 412-2244

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From: Fasnacht [mailto:fasnacht@comcast.net]
Sent: Thursday, August 08, 2013 7:27 PM
To: Brown, Madeleine (ECY); Pollet, Gerry; Holmes, Erika (ECY); Dahmen, Lois (ECY)
Cc: Cantwell, Maria; Denny Heck for Congress
Subject: Public Comment on Hanford Cleanup

I am attempting to comment on HANFORD area 300 cleanup plans during this Public Comment period and am sorry I cannot be in Hood River this evening.

I am a former resident of the tri-cities. An Uncle died of exposure to nuclear waste at a plant in Rainier, Oregon.

I've attempted to support WA. DOE, in their commendable efforts to support cleanup. I have been bitterly disappointed in our USDOE because promises have not been kept. I continue to read current plans to clean up area 300 at Hanford. The newest proposal is again a delay – a distraction. The proposal AVOIDS ANY REFERENCE TO THE POLLUTION OF THE COLUMBIA RIVER AND PACIFIC COAST OF OUR USA! It avoids any mention of the impact on ALL citizens, animals, and fish dependent on the purity of our precious river! Crap is ALREADY leaking into the Columbia, and there is NO serious discussion of the consequences in the "plans".

Re: Underground tanks - I understand they "can't" request the necessary funds for 2 years to address the underground tanks that are leaking. In fact, if I understand the most recent "plan" (I use the term loosely), they want to remove fluid from tanks so they will hold additional toxic waste.

Public Comment to anyone who will listen:

1. I am aware of proposed WA DC legislation that would allow shipment of highly toxic nuclear waste by train throughout the lower

48. I insist this legislation be placed on every ballot in the Country! This should be up to the American people who will be put at such great risk! Better yet, withdraw the proposed legislation.

2. I am aware of efforts to make Hanford a "national" nuclear waste dump. Really stupid! ON A MAJOR RIVER CORRIDOR THAT LEADS TO THE PACIFIC OCEAN? Are we self-destructive? (Well, yes.)

3. RECOMMENDATION/DEMAND: All 23 (#?) licenses granted to Nuclear Power Plant developers during/right after the Bush/Cheney era should require that those plants STORE the waste WHERE IT IS CREATED, or, don't build the plant!

4. I propose that NO MORE POWER PLANTS OR WEAPONS that create Nuclear Waste be licensed or built until SAFE Nuclear Waste Disposal technology is developed, and in place!

5. **I propose that MAJOR research dollars be devoted to the development of PERMANENT NUCLEAR WASTE DISPOSAL TECHNOLOGY. NOW! INCLUDING SPACE TECHONOLOGY AND ROCKETS TO THE SUN!**

6. JUST MY OPINION: Our major challenge is to **protect the Columbia River from further pollution.**

As dangerous for employees as this sounds, and unprofitable to "investors", at Hanford, I believe we need to extract and transport

ALL contaminated soil, liquids, solids, and containers from below and above ground, and move them to a location in Washington,

Oregon, or Idaho, which is not subject to eruptions or earthquakes. We need to contain them there using available science, UNTIL

WE HAVE DEVELOPED THE SCIENCE FOR PERMANENT DISPOSAL.

Note: Gasification has not been perfected, and only makes it easier to store. It does NOT reduce the poison.

Your very concerned citizen,
Sharon Fasnacht, Mediator, Guardian Ad Litem
Confidential Dispute Resolution
(360) 753 8009

From: Jan Castle <jancastle@comcast.net>
Sent: Monday, August 12, 2013 12:29 PM
To: ^300 Area Proposed Plan
Subject: Comments on 300 Area Clean-up Proposal

Comments on 300 Area clean-up proposal

This plan is inadequate and illegal. It does not meet Washington State's requirements to protect the most sensitive populations with the reasonable maximum foreseeable exposure, which in this case would be Native American children exercising treaty rights along the river.

Sequestration of uranium contaminants in phosphorus is not practical for two reasons;

1. It takes too long. People are already recreating in the area. It is unconscionable to expose people to contaminants in the 22 years it would take for the groundwater contamination levels to fall below drinking water standards.
2. If it works, it still leaves the contaminants in the soil. Any future development in the area will dig up the soil and release the contaminants.

USDOE continued to put these contaminants in the soil in the 1990s, after clean-up was started, when they should have known better. This is an example of the short-sighted and poorly conceived processes that USDOE has used, and is currently under investigation for. It would be far better for USDOE to come up with an actual clean-up plan for this area, rather than another plan that evades their responsibility to the public.

Submitted by

Jan Castle
16181 Parelius Circle
Lake Oswego, OR 97034
503-636-6709

From: Shauna Flanigan <smcflani@gmail.com>
Sent: Thursday, September 05, 2013 10:40 AM
To: ^300 Area Proposed Plan
Subject: Seven Generations - 300 AREA- CLEAN UP FOR GOOD

Shauna Flanigan

11836 SW Breyman Ave

Portland, OR 97219

503-421-0533

smcflani@gmail.com

Kim Ballinger 09-05-13

US Dept of Energy

Richland Operations Office

PO Box 550 A7-75

Richland, Wa 99352

Dear Department of Energy,

I am a 4th generation Oregonian, my Great-Grandmother and Great-Grandfather settled in Cottage Grove, Oregon in the early 1900's. My Grandmother and Grandfather grew up farming in the Willamette Valley. All three of my children were born in Hood River, Oregon and this month, my Grandson, who was born in Portland turns two. When this young child grows up and has children those will be the 7th generation. It is for our present and future generations that I am deeply concerned about the clean up at Hanford.

We must do better. I am in favor of the most complete clean up possible. The proposed 3a, enhanced attenuation is not stringent enough. 22 years is too long to wait for groundwater to be cleaned up to safe levels along the Columbia. We need to require removal of contamination in the soil above the groundwater. We need to be following state and federal laws which require "permanent remedies"! 15 feet in not nearly an adequate depth to remove the Uranium and other contaminants that USDOE historically and until the mid 1990's dumped into the groundwater. 30 to 40 feet depth is more realistic to meet the removal, treatment and disposal (RTD) of contaminated soil. Money must be spent to complete cleanup and protect the groundwater and the Columbia River.

We cannot wait decades to clean up the soil. Injecting phosphate to hold the Uranium in place does not reduce or remove the risk of the contamination. It merely binds it in place. Since sequestration is experimental, it cannot be depended on. Since the future of the Hanford 300 Site is unknown, radioactivity and soil toxic with Uranium must be completely treated now. We must prevent exposures.

Children and future generations must be protected. Cleanup levels need to seek to reduce exposures to 2millirem per year. We must meet the EPA's Superfund (CERCLA) requirement that radiation risk not cause more than one additional cancer for every 10,000 people exposed. Risk estimates need to be updated. Women and children are now known to be more susceptible to get cancers and these sensitive populations must be protected.

The 300 Area is subject to high and low water level fluctuations. Clean up should be coordinated with the dams. Such important issues cannot be dismissed as "DOA"! Cooperation should be negotiated with education for the good of humanity and the health of future generations.

I appreciate your concern and effort in helping to create the best outcome for all of our grandchildren, and seven generations beyond.

Sincerely,

Shauna Flanigan

(Though this is not the topic of this particular public comment, let it be known that I believe it is critical to shut down the active nuclear reactor now operating at Hanford. The reactor is just like the one at FUKUSHIMA, which is a failure and we must SHUT IT DOWN TODAY.)

From: David Craig <davidc5033@yahoo.com>
Sent: Monday, September 09, 2013 9:33 AM
To: ^300 Area Proposed Plan
Subject: Clean Up Hanford Toxic Pollution

Categories: Red Category

Mr. Matthew McCormick
U.S. Department of Energy
P.O. Box 550
A7-75
Richland, WA 99354

via email: 300AreaPP@rl.gov

Clean Up Hanford's Toxic Pollution!

Dear Mr. McCormick:

I support the removal, treatment and disposal of radioactive and toxic pollution from the Hanford Nuclear Site, beginning with pollution in the forty square miles where uranium was processed into fuel rods, the "300 Area." I support a plan that continues to remove the uranium and other contaminants, prevents further groundwater contamination, and protects future generations from ongoing pollution.

I am concerned that Energy's proposed cleanup plan for the 300 Area will leave too much uranium and other toxic pollution in the ground. The proposed plan bets on experimental technology to bind uranium to the soil. If this does not work, uranium will slowly contaminate the groundwater and flow to the Columbia River. This "do nothing" plan does not adequately protect the human health and the environment, including endangered salmon that spawn in the Hanford Reach of the Columbia River, and those who live, recreate and fish in the Hanford Reach.

I am also concerned that Hanford cleanup is dictated by a core assumption about how future generations will use this site. Energy's reliance on an industrial standard defies reasonable assumptions of future use and allows Energy to get away with less cleanup.

Specifically, I urge Energy to:

- evaluate a broader range of alternatives, particularly ones that involve digging up the most highly contaminated soil;
- develop a "Plan B" to ensure the government deals with uranium pollution if experimental polyphosphate injections prove ineffective;
- uses a more protective standard to ensure cleanup protects future generations that use the site for drinking water, fishing, farming, and outdoor recreation.

Thank you for the opportunity to comment about the proposed cleanup plan and Hanford's affect on the Columbia River and river communities.

Sincerely,

David Craig

From: Leslie March <lesliemarch@hotmail.com>
Sent: Monday, September 16, 2013 1:48 PM
To: ^300 Area Proposed Plan
Subject: Comments

September 16, 2013

Sent by email to **300AreaPP@rl.gov**

Dear Sir:

I am concerned about the clean-up of the 300 area because of the threats that will be exposed to the Columbia River. Please consider the following points:

1. Follow Washington's state cleanup law (MTCA) and require all areas along the Columbia River to be cleaned up to levels safe for children and unrestricted future public uses and exercise of treaty rights by Tribes to live along and fish this stretch of River shoreline.

a. The 300 Area is no longer "industrial" and needs to be cleaned up to Washington's unrestricted use standard, because it is easy to foresee that this area will be redeveloped to allow river shore commercial and recreational uses, even residential use. Already many people use the area for recreation – which the Proposed Plan ignores.

b. Treaty rights require cleaning up to levels safe for Native Americans to use the shorelines and River corridor.

c. The Plan fails to consider that the 300 Area shorelines are "shorelines of statewide significance" and are also additionally required to be protected as critical areas. Best Available Science is required to be used in protecting these areas and human uses. Monitored Natural Attenuation and use of untested technology are not best available science. Nor is it legal to allow contamination to flow from an industrial cleanup zone into such shorelines and areas for which unrestricted future use must be protected. At minimum, the Plan must take actions to allow unrestricted use, including of groundwater and resources, of the entire shoreline zone, which extends inland at least 200 feet from the high water mark.

2. 22-28 years is too long to wait for groundwater to be cleaned up to safe levels along the Columbia River – especially the area which is the southern gateway to the Hanford Reach National Monument.

3. Require removal of contamination in soil above the groundwater. Do not allow USDOE to claim that "doing nothing" other than monitoring is a legal cleanup remedy. Reject the "monitored natural attenuation" and "enhanced natural attenuation" proposals.

a. Follow state and federal cleanup laws which require use of "permanent remedies", which is the removal, treatment and disposal of contaminated soil, particularly uranium, cesium, strontium, PCBs and TCE.

b. 30 to 40 feet is hardly too deep to remove the uranium and other contamination which USDOE dumped into the groundwater.

4. Don't reward USDOE for having continued to pollute the soil and groundwater for decades – even after it was illegal. USDOE kept dumping massive amounts of untreated liquid wastes into soil ditches along the River in the 300 Area until the mid-1990's, when stopped by a lawsuit by

Heart of America Northwest and citizen outcry. Now, USDOE should be required to spend the money to cleanup to protect the Groundwater and River!

5. Follow state cleanup law and require cleanup to a level which protects our children and future generations from cancer risks greater than 1 additional cancer for every 100,000 children who will be exposed to the soil, groundwater, contaminated fish and plants. 15 millirem, the radiation dose proposed to be allowed as "safe" does not even meet the EPA's Superfund (CERCLA) requirement that the additional risk not cause more than one additional cancer for every ten thousand people who will be exposed. To meet the standard, the cleanup levels need to seek to reduce exposures to 2 millirem per year – and, combine all carcinogens in meeting the standard.

a. In the 1990's the NRC and EPA projected that doses of 15 millirem per year would result in over 5 additional cancers for every 10,000 people exposed.

b. In 2006, the National Academy of Sciences updated the risk estimates for radiation exposures, in a report which is supposed to be the basis of revised

300 Area Plan Comments of Heart of America NW, HoANWRC, LAW Page 14

standards. However, neither EPA, USDOE nor WA State has updated their risk estimates. Under the BEIR VII best national consensus estimates of risk, 15 millirem of exposure would be projected to cause 8 additional cancers per ten thousand exposed people in the general public. Women are 60% more susceptible to get cancer from the same exposure, and children even more susceptible. Washington State's cleanup law requires protecting the most sensitive population with the reasonable maximum foreseeable exposure – for the 300 Areas this would be Native American children exercising treaty rights along the River.

6. Do Not rely on an unproven technology of injecting phosphate to hold Uranium in place instead of removing the Uranium.

a. Sequestration is an experiment. It is not acceptable to use sequestration except in a small area as an experiment to be followed for decades.

b. We can't wait decades to clean up the soil and meet groundwater standards!

c. Sequestration does not remove either the risk or the contamination. When a future builder comes along and digs up the soil for a sewer line, it will still be radioactive and toxic with uranium. People will be exposed. USDOE hasn't been able to even keep track of where it dumped Plutonium or placed high-level nuclear waste pipelines, we can't expect that the locations of contaminated soils throughout the 300 Areas will be tracked for decades and hundreds of years and excavation and watering of lawns prevented!!

7. Retrieve uranium below fifteen feet and consider a range of alternative techniques for dust suppressant while excavating to prevent significant amounts of water from mobilizing the uranium into the groundwater during cleanup, including, the possibility of using the phosphate injection for these areas in conjunction with significantly expanded retrieval.

USDOE should be required to spend the money to cleanup to protect the Columbia River to protect this resource for future generations. My concerns are as a fifth generation resident of the Northwest. We need to take responsibility to protect the public and future generations.

Leslie March

Sierra Club Nuclear Free Campaign

2229 SE Spruce St.

Hillsboro, Or. 97123

Leslie March
Penguin Place LLC
503-547-5479

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it is the only thing that ever has."

- **Margaret Mead** (1901-1978) quoted in John M. Richardson, ed. *Making it Happen*, 1982